

CORVINUS UNIVERSITY OF BUDAPEST
MANAGEMENT AND BUSINESS ADMINISTRATION
DOCTORAL PROGRAM

IMPROVING SERVICE QUALITY IN RETAIL TRADE
-THE PREMISES OF A POTENTIAL MEASUREMENT MODEL
AND A DECISION SUPPORT SYSTEM BASED ON IT-

PH.D. THESIS

NORBERT BECSER

BUDAPEST, 2007.

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INSTITUTE OF BUSINESS ECONOMICS
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1. INTRODUCTION

In this chapter I would like to introduce the premises and the objectives of my thesis, stressing the chosen topic's theoretical and practical importance in the economy. Further, I would like outline my basic concepts, their connection points, as well as the theoretical models to be developed and examined herein. After a brief review of the structure of my thesis, I set forth a short summary of the most important conclusions I could draw from researches.

1.1. THE SIGNIFICANCE OF THE ISSUE

Quality, particularly service quality, has become one of the most important concepts of management-related publications. The importance of the subject is indicated by the fact, that in the last ten years the number of publications on service quality has increased to ten times of the original volume. In a search made on service quality ABI/INFORM Global showed 13.852, results in June 2007, while the same search resulted only 1447 documents in April 1994.

As consumer society has gained ground, demand for such products and services grew, which (with a technical term of quality studies) meet the expressed (or implied) expectations of the customers. Hunt (1993) argues that the companies, not capable to offer high quality products or services, eventually lose their competitive advantage, which -though narrowing their market potentials- may lead to economic isolation. In order to be able to remain competitive on today's market, companies need to pursue high quality in all respects. Today, beside manufacturers and producers, service providers and particularly retailers have to face fierce competition too. This is especially true in light of the 2007 report of EuroStat, indicating that within the 25 members of the European Union 60-75% of the total economic production is originated by providing services. Likewise, the rate of services in the Hungarian economy exceeds 65% (EuroStat, 2007). Among services, commerce; and within commerce, retail trade is of fundamental importance. According to the EcoStat survey, among medium size companies the ones that provide commercial services are the most efficient (ECOSat, 2006).

Market competition effects retail service providers most profoundly. Nowadays, customers can choose from a multitude of retail establishments, offering identical products and services, thus the retailer is forced to distinguish itself from its competitors. In other words, the retailer has to serve its customers better, in a different way or at a higher quality level. Accordingly, in order to remain competitive and to comply with the requirements of the standardized quality-management systems (e.g. ISO 9001), retail service providers need *quality-conscious business management and quality improvement*. Quality-conscious business management means an opportunity for systematic review, regulation, accountability and self-revision for business organizations; at the same time it provides a competitive edge through the close relationships built with clients and the constant improvement of service quality standards (Hernon, 2001).

The competitiveness research of the Corvinus University of Budapest, and a related 2006 American research (Sacramento, California), also supported the presumption, that decision makers usually rely on their intuitions in making quality-management decisions, of course in light of the data determining their basic approach. (Zoltayné, 2006). While there are several models, assisting the top management of manufacturing and production companies with selecting the quality improvement approach that best suits them; managers working in the retail service sector are offered only a limited number of models.

Based on the experiences, I gained as quality assurance consultant for almost ten years; I can also confirm that quality improvement in the Hungarian service sector, particularly in case of small and medium size retail businesses, has a long way to go. In most cases, these companies have no money, capacity or other resources to improve service quality. This is so, even though Hungarian company managers admit, that quality improvement is one of the most important factors of successful company performance (Gittins, 2007). This opinion was supported by a research, conducted in 2006 by Wimmer et al. in Hungary with the participation of Hungarian-owned medium companies, noting that companies mostly analyze and apply performance indicators, which are the easiest to measure (Wimmer et al., 2006). The above finding also supports that a simple, user-friendly retail service quality measurement scale, together with a decision support system based on that, could be accepted and successful on the market. These models assist managers and decision makers of small and medium businesses with getting a better picture on the

quality of the their services; with determining their action plan alternatives (line of conducts) in connection with quality improvement decisions; as well as with developing adequate alternatives in terms of time, place, customer satisfaction or a combination of the above.

1.2. THE THESIS`S OBJECTIVES

My thesis has dual purpose. On one hand, I attempt to determine a retail service quality scale applicable and valid in the Hungarian business environment, on the basis of the available service quality models. On the other hand, I would like to set forth the conceptual basis of a decision support model based on the above method.

The task set by this thesis is rather complex and to accomplish that, multi-disciplinal research methods have to be applied. Retail service quality is directly assessed by the customer, thus determining the adequate service quality measurement model and thorough testing, is of fundamental importance. The field of consumer expectation and service quality is examined by the disciplines of marketing (service-marketing) and service management. Quality-management plays an important role in determining the concept of quality, the direct and indirect connections of service and quality, and the relation of service quality and organizational performance. It is especially true for researching models to support potential quality improvement.



Figure No.1: Disciplinary framework of the thesis

The specific fields of decision theory and the principles of decision support are important for the practical development of a decision support system aimed at improving retail service quality. In my thesis I systemize the findings and results of

marketing science (service-marketing; service-management), quality-management and decision support, if relevant for my subject-matter (Figure no.1).

In my study I attempt to prove that quality-conscious business management and quality improvement have a positive connection with organizational performance, as held by several other researchers.

In developing the retail service quality scale, I use the general SERVQUAL model (Parasuraman et al., 1988) and by studying specific retail scales (for example Dabholkar et al., 1996), and adopting the latest theoretical and practical results (Sureshchandar et al., 2001), I examine my conceptual model in consideration of the requirement to collect, process and present data in a simple and programmable manner. Similarly to several researchers (Dabholkar et al., 1996; Brady and Cronin, 2001), I presume that retail service quality is a multidimensional, hierarchical structure: in the theoretical model retail service quality is determined by primary dimensions, to which further sub-dimensions are connected (Figure no.2). *According to my hypothesis, service quality is the result of a multi-level assessment, which is formulated by the customer by perceiving the service provider's performance.*

I describe the conceptual decision support model aiming at improving retail service quality, by taking into consideration the principles of decision theory, the decision support systems (DSS), as well as the steps made to develop thereof.

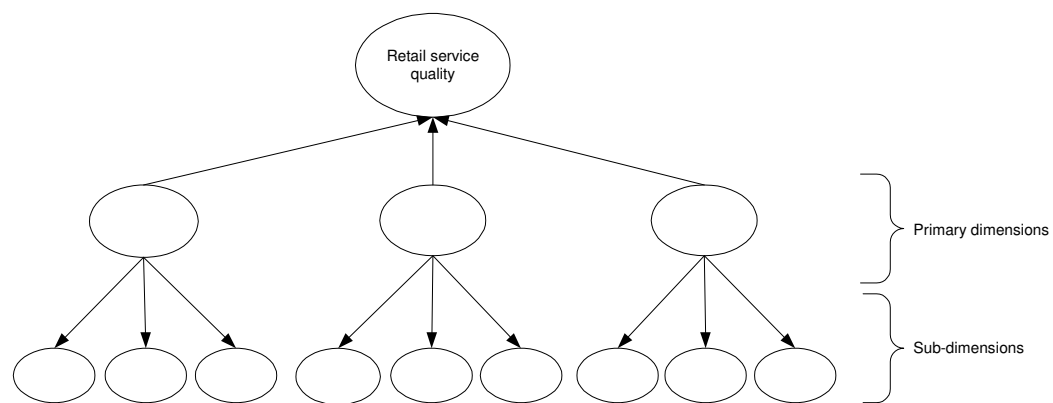


Figure No.2: Theoretical model of retail service quality

Pursuant to my hypothesis, *the system -by applying the Internet and the company intranet as communicational channels, by providing regular and categorized information on the basis of the retail service quality scale, and by processing thereof*

– *determines alternatives (mostly presented graphically) and assists decision makers in making decisions on retail service quality improvement.*

1.3. THESIS STRUCTURE

The structure of my thesis reflects its dual objective. Subsequent to establishing the theoretical basis (chapters 2-3), I present the findings of the literary research focusing on developing the model for measuring retail service quality as well as the results of empirical tests conducted in the field (chapters 4-6). The third chapter of the thesis presents the conceptual basis of the decision support system aimed at improving retail service quality through the developmental measures taken (chapters 7-8).

In line with the above-described conceptual basis and the process of my qualitative and quantitative researches, my thesis is structured according to the following chapters:

In **chapter 2**, via overviewing the relevant professional literature, I provide an interpretation of the definition of service, quality, services and service quality. I review the approaches to define quality, that are the most important for the purposes of my thesis, as well as the service typologies, and -via describing the characteristics of the services- I will turn to the (retail) service quality definition that I accept in my thesis. In **chapter 3** I would like to substantiate the theoretical and practical importance of my thesis topic, by discussing the Hungarian and international researches conducted on the issue of service quality and organizational performance, as well as by presenting the results of the empirical research results reached by my efforts. Furthermore I address the most recent studies, pointing out the economic importance of the services, specifically that of retail services. I highlight the major conclusions reached by recent researches relevant to the role that quality plays in the service sector, and the causal connection between service quality and organizational performance. Further, I provide a detailed presentation of the empirical tests, conducted on my hypothesis relevant to the positive connection of service quality and organizational performance, from data-collecting, via describing the research methodology, to setting forth the results and the conclusions.

As a result of the complex nature of service quality and its multiple interpretations, the researchers formulated several models on service quality. In **chapter 4** I present those service quality models, which are the most important for the purposes of my thesis, giving a short summary on their basis, presumptions and connection points. Subsequently, I analyze the SERVQUAL model, one of most influential models of service quality related publications, reviewing the critical remarks it provoked as well as the arguments and counter-arguments stated for and against the model.

I presume that the SERVQUAL scale and its dimensions are suitable to determine retail trade service quality. To prove the above hypothesis, I summarize my empirical researches conducted on testing the applicability, reliability and structural validity of the SERVQUAL scale and its dimensions. Pursuant to the completed studies we can conclude that the dimensions of the SERVQUAL service quality scale, previously used as a general model, unfortunately only partially applies to retail services. Due to the above facts, a new retail service quality model must be developed that is adequate to the Hungarian retail suppliers, while also meets the requirements of the decisions support system to be developed (such as simple applicability). In **chapter 6** I present the process of refining this model, from developing the scale, to the empirical tests conducted on the applicability, reliability and validity of the model. Accordingly, I set forth the evaluation of my hypothesis on the adequacy and the structure of the model, the results of the applied quantitative data-processing methods (factor-analysis, reliability tests, SEM analysis, and regression calculations), the limits of the research and the further tasks to be accomplished.

Having developed the model, I was able to formulate the conceptual basis of a decision support model aimed at improving retail service quality, as well as the developmental steps of formulation. In **chapter 7** I examine the relation of decision support and quality improvement, particularly, the characteristics of the individual decision process, the connection points of quality, quality improvement and the connected decision making phases, as well as I give a short analysis on the purpose, the definition and the development of the system. In **chapter 8** I discuss the requirements of a decision support system aimed at improving retail service quality and its operational principles. By presenting the advantages and disadvantages of the system I determine the upcoming theoretical and practical tasks. Finally, in **chapter**

9 I summarize the results produced by my research and the conclusions drawn from those. Subsequently, I point out the most important results of the thesis, thereby showing the importance and applicability of the chosen subject-matter and the developed models.

1.4. THE MAJOR CONCLUSIONS OF THE THESIS

As a summary of the completed qualitative and quantitative researches, I was able to work out the conceptual basis of a retail service quality model, which is of great use for the Hungarian retail traders, as well as that of a decision support system aimed at quality improvement.

Subsequent to analyzing the professional literature, my empirical research proved that it is worth it to invest in service quality and quality improvement, since higher quality standards will lead to better organizational performance. In the course of researching the retail service model - that is validly applicable in the Hungarian economic environment – by completing a great number of qualitative and quantitative analysis, I have shown that the structure of the SERVQUAL model (Parasuraman et al., 1988) and the dimensions thereof are not applicable to the field of the Hungarian retail services.

Eventually, I have elaborated a hierarchical model to assess retail service quality, which utilizes the basis of SERVQUAL and synthesizes that with several already existing models (Dabholkar et al., 1996; Brady and Cronin, 2001) and the recommendations of cutting edge service quality related research results (Sureshchandar et al., 2001). In the new model the category of retail service quality may be interpreted on three different levels: comprehensively, on the level of the primary and the level of secondary sub-dimensions. The overall quality of the service is assessed by the customer through the prior dimensions (physical aspects, reliability, personal contact, business policy) and the seven sub-dimensions connected thereto (physical appearance, comfort elements, employee skills, problem solving, service-product service-availability, social aspects) The completed suitability, reliability and validity tests as well as the cross-validity tests have supported the applicability of my model.

In presenting my model, I have defined the conceptual basis of a decision support system aimed at improving retail service quality, as well as the measures to be taken

to develop it. I have attempted to set forth the future tasks of refining the system, hoping that it – as a market-ready, widely usable system – will be a useful tool in the hand of the decision makers of the retail service providers in substantiating their decisions regarding service quality improvement, and accordingly in increasing organizational performance.

2. QUALITY – SERVICES – SERVICE-QUALITY

In the upcoming chapter, I would like to present the most important definitions used in my thesis, as well as their different interpretations – through a detailed overview of the relevant academic literature.

There is no one unambiguous definition of quality. It has different meanings for different individuals mostly due to its subjective nature. Through tracking the development of the concept of quality, I present the different approaches followed by the different researchers (the five approaches of Garvin (1988), the process quality theory of Veress (1996), the strategic quality interpretations of Tenner and deToro(1992)), and by synthesizing those, I outline my own definition, which I apply in this thesis too.

I outline the concept of services on the basis of several Hungarian and international approaches (Kotler, 1998; Papp, 2003; Parányi, 2003, 2005a, 2006; Róth, 2006) and service-typology (sectoral, marketing, statistical and economic approach), and by construing those, I describe the field relevant for the purpose of this thesis: the field of retail services.

The interpretation of service-quality largely depends on certain characteristics of the service (such as intangibility, uniqueness, inseparability, uncontainability). Subsequent to giving a detailed presentation thereof, as well as analyzing their effects, I introduce the most persistent service-quality approaches found in the professional literature – among them the interpretation originating from the so-called Gap- model (Parasuraman et al., 1988) - and define the service-quality concept applied in my thesis.

2.1. THE DEFINITION OF QUALITY

Numerous researchers and scientific associations have tried and are trying to define the concept of quality based on different aspects. It is safe to say, however, that as of this day we do not have one uniform definition. The main reasons of it are found in the below characteristics of the quality (Veres, 2005, p. 68.):

- quality is objective and subjective at the same time, it can only be generalized to a limited degree,

- among its factors there are specifications, which can be measured; and others, that only can be appraised,
- quality can mean a technical-efficiency level and any departure therefrom (condition),
- it has perceivable use effects and effects that the purchaser does not consciously perceive.

2.1.1. DEVELOPMENT OF THE DEFINITION OF QUALITY

Parányi (2003, 2006) describes the change of the concept of quality in light of the historic development. Quality originally was connected to tangible products and as supported by Juran's "*fitness for use*" (Juran, 1988) and Crosby's "*zero defect*" theory (Crosby, 1979). Later this interpretation expanded lineally as well and experts started to apply the concept of quality (and its criteria) to all elements of the production chain, creating products or services, rather than to one product. In other words, they addressed the quality of the entire production or consumption process (e.g. in assessing the quality of a product, the production-, sale-, and customer service procedures are taken into consideration as well). Feigenbaum defined the quality of a product or a service as „*the total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use will meet the expectations of the customer*” (Feigenbaum, 1991, p. 7.).

The subsequent development was characterized by a shift towards the service quality of intangible products (such as research and development, engineering). As the significance of services in the economy skyrocketed, quality too started to have an ever-expanding importance in the sector. Quality was interpreted relevant to the full spectrum of the service sector: from industrial services (e.g. telecommunication), through personal and small-business services (e.g. hair salons) to public services (such as education and health care).

One constant component of the quality definitions is meeting customer expectations or demands. Be it a product or a service, suitability to meet customer demands is a significant, if not the most important, element of the concept of quality.

As Freund put it: „the characteristics of a product or service that bear on its ability to satisfy stated or implied needs” (Freund, 1985, p. 50.)¹. Pursuant to Deming’s interpretation, quality „exceeds” the expectations of the buyer during the lifetime of product (or service). In his opinion the concept of quality has no meaning, unless it composes (frames) the expectations of buyers (Deming, 1986).

While according to the traditional interpretation, quality meant compliance with internal prescriptions and standard; then it was identified with suitability for use; in the most current interpretation of the word, quality means not simply meeting or exceeding buyer needs, rather meeting or exceeding *environmental, social expectation* (see Figure no. 3).

Today “quality is construed in a more comprehensive manner; it refers to the entire organization (company, instrument), its environment, infrastructure and the society as well. Organizational, social culture as well as the category of life-quality gain true quality content.” (Parányi, 2006, p. 8.).

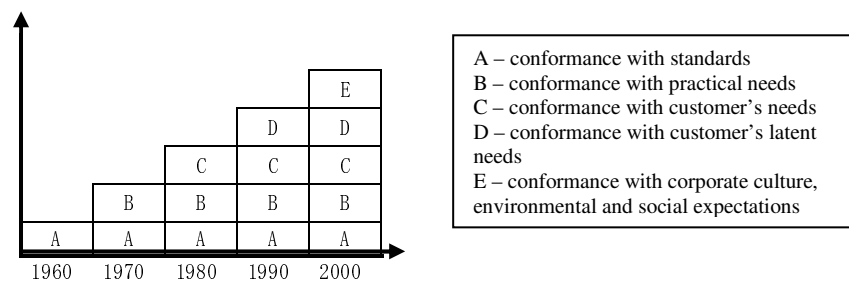


Figure No.3: Development of the interpretation of quality (Source: Kormos, 2000, p. 18.)

2.1.2. APPROACHES TO DEFINING QUALITY

Majority of the definitions are originated by the etymological interpretation, which holds that quality is a status, a characteristic, the fitness or the value of performance. In Garvin’s definition quality means the totality of the above factors (Garvin, 1984). Among the multiple definitions of quality, beside the above comprehensive interpretation, further interpretations are possible according to the direction or the main factor of the definition. Garvin (1988, pp. 41-46.) on this basis defined the five quality approaches as follows:

¹ This definition is corresponding to the definition accepted by the American Society for Quality (<http://www.aservicequality.org/glossary/q.html>)

- *Transcendent*: quality can only be determined by empirical experiences, e.g. we can only judge the work of a fine artist (the work quality) if we look at his work.
- *Product-based approach*: quality is defined by the existence or lack of certain characteristics. If the product or quality – from the viewpoint of the person making the judgment – has advantageous, desirable characteristics, the customer will find it a high quality product or service.
- *Manufacturing-based approach*: quality means that the product or the service in the course of manufacturing conforms to the predetermined expectations and specifications. If the specifications are not met, the quality is poor. This approach presumes that the product or service specifications are closely connected to the buyers' expectations, and compliance with those will determine customer satisfaction.
- *User-based approach*: quality is determined by the user. Meeting the customer's expectations is the central criteria of the concept of quality. This approach is parallel to the "marketing concept" of Kotler (1998), which states that the primary objective of an organization is to fully satisfy the customer.
- *Value-based approach*: quality is determined by the rate of the efforts, the customer must exercise to receive the service or to possess the product (e.g. money, searching) and the gain (value) derived from using the service or acquiring the product. Acquiring a certain product at a reasonable price will make the customer perceive that quality is higher (feeling that it is worth it), than purchasing the same product at a high price.

2.1.2.1. PROCESS QUALITY

Veress determines quality as the quality of the overall production-consumption procedure. Veress maintains that: "the *quality of the production-consumption process* is the judgment of those interested in the production-consumption procedure (the consumer, the producer and the society) on the *value* of the above procedure as influenced by the *environment* of the connection existing between the procedures (e.g. the development of market economy, the organizational structure of the state administration and that of the market economy" (Veress, 1996, pp. 32-39.). Besides the subjective characteristics of the quality, he includes the factors of the reliability

of the procedure (the expected time of procedure's, faultless operation) and the safety of the procedure (whether the procedure contains no danger for the concerned parties).

The definition of quality needs to be separated from the concept of fitness. He maintains that "the procedure (product, system) is fit if it meets the provisions of the given requirement system" (Veress, 1996, p. 40.). However, in the assessment of customer, compliance with the criteria does not necessarily equal to quality (Veress, 1996).

2.1.2.2. STRATEGIC QUALITY

As we could see, there are several theories on quality, but –regardless of the chosen definition – we must avoid interpreting it as a well-sounding but empty phrase. On the organizational level quality and quality-consciousness is a strategy, which is implemented in the organization, pervading and following the procedures. Tenner and DeToro held that quality is *"a basic business strategy that provides goods and services that completely satisfy both internal and external customers by meeting their explicit and implicit expectations"* (Tenner and DeToro, 1992, p. 31.).

2.1.3. CONCLUSIONS RELEVANT TO QUALITY DEFINITIONS

The ISO 9000 quality management system provides a general interpretation of quality. The technical dictionary (ISO 9000:2005) defines quality as the "degree to which a set of inherent characteristics fulfils requirements". In this format the definition reflects the general nature of the standards, and requires explanation at many points depending on the field of application.

The definition can be interpreted relevant to the production/service procedure and to the result of the procedure. According to the premise of the definition, quality is an overall value, derived by comparing the expectations and the inherent characteristics; but because of its general nature, it is not clear which are the examined characteristics, and what expectations those have to meet. In case of products (both tangible and intangible) these are objectively determined requirements. In case of services subjectivity is significant, because circumstances are determined not only by the individual, but the service and its environment too.

In connection with physical or other (such as intellectual) products and their production, the characteristics to be assessed are often clearly identifiable (such as

screw nuts, where the characteristics are determined by standards (such as diameter, thread etc.) In comparison, in case of services (which are based on the interaction of the individual and the organization, and where the role of the subject is stressed) intrinsic characteristics are also determined by the process of the service, the result, the geographical place, or the culture of the place where the service is provided, and this makes any generalization problematic.

In this thesis, based on the relevant professional publications, I accepted the following comprehensive definition of **quality** (which in my opinion is a comprehensive definition of high information value):

Quality means the comprehensive value judgment of the customer rendered in connection with a given unit, expressed by the degree of meeting or exceeding the material internal and external specifications relevant to the unit, as perceived by the customer.

Intrinsic characteristics are determined by the organization and the objective features determined by entities surrounding the organization (e.g. sectoral standards, internal rules, social expectations etc.) External qualities are rather determined by subjective customer expectations and preferences relevant to the unit. The factors determining quality may of course change on an individual basis.

2.2. DEFINITION OF SERVICES

A uniform definition of service has not been developed up to this day. Beside theoretical constructions, several classification structures are accepted in the professional literature.

The most accepted definition approaches the concept from the activity side of the service. Pursuant to this approach service „is the result of such activities, which facilitate that the condition of a person, object, information –maybe process– is maintained (repaired), forwarded, stored, supplemented, improved or transformed, without changing its basic character. The result of the service usually cannot be stocked up, and no new product in a physical-objective form is produced. Rather the conduct directly satisfies the common personal or communal needs of persons and the society, as well as the demands of the production process.” (Papp, 2003, p. 17.)

Pursuant to the Classification of Services (2003): „service is the result of the activity which satisfies needs typically by establishing a direct connection with the customer.

It usually does not take a physical-material form, rather is manifested by improving or maintaining the condition of economic units, objects or persons”

Pursuant to Kotler „service is an act or performance provided by one party to the other which fundamentally is not materialized and does not result in creating ownership over things. Its production is either connected to the physical product or not.” (Kotler, 1998, p. 515.). According to this definition there are five groups:

- (1) clearly physical product (e.g. computer);
- (2) physical product with collateral services, where the services are connected to the materialized product (such as services connected to selling computers e.g. maintenance warranty services);
- (3) hybrid offer, where the offer is a mixture of the physical product and the services (such as clothing store which offers alteration);
- (4) material service with minor collateral services and physical products (such as wellness hotel service, containing the hotel service, physical products and other collateral services (catering, pool services);
- (5) clearly service, such as consultancy.

A definition of service – in line with concept the ISO 9000:2000 standard-family – may also be derived by defining the procedure. Procedure is the series of activities which transform inputs to outputs. Accordingly, from a certain input, via the service procedure a certain output is formed in case of services too. Service can be interpreted as the result an activity that takes place where the supplier and the customer interact with each other, and generally is not tangible. (Róth, 2006, Chapter 12.3.2.).

Accordingly service can be:

- an activity carried out on the tangible product provided by the customer (cloth cleaning)
- an activity carried out on the intangible product provided by the customer (accounting)
- providing, creating intangible product to /for the buyer (education, health care)
- providing, manufacturing tangible product to the buyer (commerce, postal service)

Parányi holds that the fundamental element of the service is that „the service process contains at least one activity, which must take place by the service provider and buyer meeting personally or via telecommunication.” (Parányi, 2005a, p. 20).

I argue that from the aspect of service quality measurement, the definition of quality needs to be result- and procedure-oriented at the same time, since customers judge not only the result of the services, but the process of the service provision is considered too. From the aspect of describing service quality and developing a decision support model aimed at improving service quality, the act of providing the service, is the main component. The service itself is provided in the course of the service provider and buyer interacting personally or via telecommunication. As a result of synthesizing the definitions presented by the thesis, in my interpretation service means more than the mere result of an activity (service-result); it is an interactive process (service-process) as well. ***Service** means the process aimed at meeting customer expectations, which is fundamentally based on the direct or indirect interaction of the customer and the supplier. The result of the service typically manifests itself in an intangible form.*

2.2.1. CLASSIFICATION OF SERVICES

Below I would like to introduce the different classification systems, originated by the different definitions of service. I discuss the sectoral, marketing, statistical and the economic typologies, and then on the basis of the above, I determine the circle of services, subjected to my examinations.

2.2.1.1. SECTOR BASED CLASSIFICATION

Browning and Singelmann (1978) grouped the economic activities into three sectors. The first-tier sector includes agriculture, fishery and mining; the second-tier includes the processing industry (building, food industry, textile industry, metal industry, chemical industry, other production, and public works). Services are approached as the third-tier economic sector and within this four classes are created:

- (1) Distributive services: as indicated by the name, the services with a distribution nature provided to other sectors, producers or service providers; such as transportation, storage, telecommunication, wholesale and retail commerce.

- (2) Production services: services provided to other sectors or to other producers, service providers, which are connected to production and providing services, facilitate and support the operational process; such as financial services, insurance, building services, invoicing, accountancy, legal services and other business services.
- (3) Social services: services aimed at satisfying individual or social needs (medical and health care services, hospitals, education, welfare and religious services, non-for-profit organizations, postal services, government, consultancy and social services).
- (4) Personal services: services provided to individuals (household services, hotels, housing, restaurants, liquor stores, repair services, laundry and cleaning service, hair salons, beauty salons, entertainment and holiday services, other personal services).

2.2.1.2. MARKETING-BASED CLASSIFICATIONS

Cook and his associates (1999) maintained that in determining service classes, both the marketing-oriented and the operation-oriented approaches need to be applied. The marketing-based approach sets forth the following classification criteria: intangibility, object of transformation, differentiation, type of customer, commitment. While the activity-based approach applied the criteria of: customer contact, customer involvement, labor intensity, degree of customization, degree of employee discretion and the production process.

| | | Concentration of the service | |
|-------------|------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| | | Persons | Facts |
| | Tangible | <i>Services concentrated on the body</i> | <i>Services concentrated on products and other physical goods</i> |
| | | Healthcare Travel Beauty-studios Wellness, fitness Restaurants Haircut | Forwarding Maintenance, repair Housekeeping services Laundry Gardening |
| Tangibility | Intangible | <i>Services concentrated on the mind</i> | <i>Services concentrated on intangible assets</i> |
| | | Education Broadcasting Information services Theatre, museum | Bank Legal services Bookkeeping Security services Assurance |

Table No. 1.: Servicetypology by Lovelock (Source: Parányi, 2005, p.16.)

As service marketing evolved, the model of the marketing-based classification has come to the front. Lovelock (1983) in his system classifies services according to

their physical nature. One of the differentiating dimensions is: tangibility and the other is: the concentration of the service (on persons or facts) (Table no. 1).

Schmenner (1986) classified the services on the basis of two dimensions: the degree of labor intensity and closeness of customer relations/accommodating personalized needs. Labor intensity means the rate of the organization's technology (capital) demand and the cost of the employed workforce. For example airlines belong to the low labor-intensity sector: the capital invested in fixed assets is substantial (great capital demand) while the cost of employment is relatively low. Accordingly, the following four service classes can be formed:

- (1) *service factory* – relative to the capital invested in fixed and production assets, as well as in technology, the cost of employment is low (low labor intensity), e.g. airlines, hotels, cargo transportation;
- (2) *service shop* – relative to the capital invested in technology, the cost of employment is low (low labor intensity), but the clients and customers receive customized services, the connection of the supplier and the customer is close (e.g. hotel restaurant);
- (3) *mass service* – typically services of lower technology and fixed-asset requirements with higher labor intensity (high labor intensity); standard services are typical, personal demands are less accommodated (e.g. commercial, bank services, wholesale and retail trade);
- (4) *professional service* – relative to the necessary investment the labor costs are high (high labor intensity), at the same time it provides customized services through close and mutual connections (e.g. consulting firms).

According to Lejeune (1989) services may be assigned to the following four groups:

- (1) Received services: services satisfying the daily needs of the customer which are usually connected to service facilities (e.g. repair, hospitality business), where the connection of the service provider and the customer is close, the customer's involvement and role is complex.
- (2) Professional services: services based on the expertise of the service provider (e.g. health care, training, legal services, consultancy), where accommodating the individual needs of the customer is of vital importance, and where the customer and the service provider are closely connected.

- (3) Technical services: services connected to utilizing investment products such as engineering, technical control activities, where the service is also based on the close and mutual relationship of the service provider and the client.
- (4) Possessive services: the customer acquires the possession of things through the service; the service result can be any objects, benefit or new quality, e.g. banking and insurance services.

2.2.1.3. ECONOMICS-BASED SERVICE CLASSIFICATION

A further classification potential is presented by market conditions. Accordingly Papp (2003) differentiates between two major categories: for profit and non-for-profit services. For profit services are divided into the following four sub-classes:

- (1) Services connected to production: (a) consultancy (financial or legal consultancy); (b) financial services (bank, insurance); (c) other services connected to production (maintenance, cleaning).
- (2) Service connected to distribution: (a) logistical services (e.g. transportation, storage services); (b) infocommunication services (e.g. telecommunication); (c) commercial services.
- (3) Personal services: (a) household services (e.g. hair dresser); (b) hotel, hospitality services; (c) repair services; (d) entertainment, sport-services.

Non-for-profit services are: health care, education, welfare and social services, as well as public administration, defense, law enforcement and judiciary services. (Papp, 2003, p. 21.).

Sometimes we cannot draw a clear line between the two groups; in certain cases, they have a common set. For example considering the phenomena of the tuition or the „visitation fee”, we cannot really talk about education or health care as non-for-profits services.

Pursuant to the position of the services in the social, economic reproduction process, as well as their role, Papp (2003) created the following groups:

- (1) Orientation services: services supporting individual, business or consumer decisions by directly or indirectly providing information to reproductive procedures (banking, financing services, capital-market services, marketing services etc.).

- (2) Production services: services contributing to the reproduction process by creating new value, new qualities (e.g. engineering and designing services, research, experimental development etc.).
- (3) Transformation services: services providing connection between the individual phases of the reproduction process, and playing a certain „carrying” role (transportation, commerce, postal service, etc.).
- (4) Maintenance services: services aimed at maintaining certain conditions given or determined relevant to the economy, society or the individual (public or state administration, government services, defense, hairdresser, cosmetology services).
- (5) Regenerating services: services aimed at reconstructing a former utility-value, quality, and repairing distressed conditions (e.g. repair services, cleaning, insurance etc).
- (6) Providing services: aimed at meeting needs arising in connection with the economic and social life, operation (communal services, housing).
- (7) Other services: services which cannot be categorized according to the above classifications (e.g. entertainment and sport services).

Some authors argue that the groups may be transferred e.g. banking services have a transformation function as well.

Similarly to the above, Parányi (2005a) classifies services based on their role in the macro- and micro-economy:

- (1) Sectoral (macro-) level: independent, sectoral level service-infrastructure, personal and cargo carriage, public utility companies, public education etc.
- (2) Company (micro-) level: the internal or external services supporting the operations of product-manufacturing or service organizations, as well as services increasing profitability, supplementing company profile.

„From the aspect of the service consumer, services are supplied in both cases at one end by large, specialized organized companies, **institutions** (transporter, repair company, research and development institution, supplier, hypermarket, university, hospital, theater). At the other end of line there are the **micro-organizations**: small business owners, artisans (repair cooperation, consultancy firm, attorney, doctor, grocery.)” (Parányi, 2005a, p. 15.).

2.2.1.4. STATISTICS BASED CLASSIFICATION OF SERVICES

Services, of course, can be classified on a statistical basis as well. The basis of this is the EU classification of economic activities (NACE²) which is based on the industrial activity classification of the UN³. NACE classifies the economic activities of the EU countries of similar economic development, thus it is a fairly detailed classification system. As the main rule, services are classified according to the origin of the activity, that is, on the basis of the activity which fundamentally originates the services (Nomenclature of Services, 2003).

In Hungary the Classification of Services (KSH, Hungarian Central Statistical Office, 2003) in effect is divided to the chapters presented by Table no. 2.

| | |
|---|----------------------------------------------------------------------------------------------------|
| A | Agriculture, hunting and forestry |
| B | Fishing |
| C | Mining and quarrying |
| D | Manufacturing |
| E | Electricity, gas and water supply |
| F | Construction |
| G | Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods |
| H | Hotels and restaurants |
| I | Transport, storage and communication |
| J | Financial intermediation |
| K | Real estate, renting and business activities |
| L | Public administration and defence; compulsory social security |
| M | Education |
| N | Health and social work |
| O | Other community, social and personal service activities |
| P | Activities of households |
| Q | Extra-territorial organizations and bodies |

Table No. 2.: Chapters of Classification of Services (Source: KSH, 2003)

For statistical purposes (KSH, 2003) service shall mean all useful, final products of socially organized economic activities aimed at improving, supplementing, remedying, protecting, safeguarding, representing, organizing directing developing, informationally expanding, preventing or adverting damages to, undertaking liability for etc. certain characteristics of persons, communities, the whole society, business associations, information or objects (things, procedures, systems), such as

- situation, condition
- technical, artistic, cultural level
- information status etc.

Services typically do not manifest themselves in material, tangible forms. Rather they meet consumer needs through establishing direct contact with the customer, so

² NACE - Nomenclature statistique des Activités économiques dans la Communauté Européenne

³ ISIC – International Standard Industrial Classification

as the act of providing the service (production) and the act of utilizing it (consuming) fully or partially coincide in time.

Useful results of service activities are e.g.:

- repairing, maintaining, refurbishing, designing, assembling, packing, storing, transporting, distributing objects, facilities, things; outsourcing their manufacturing or processing procedures; providing quality control; collecting, processing, storing, transferring, conveying and distributing information;
- asset lending aimed at supporting the operation and production of economic associations, data processing, business management and technical consultancy, promotional activity, market research, advertising, business administration, legal and other economic services;
- transporting persons, objects; product delivery for consumers, carrying out financial and insurance operations;
- meeting the educational, cultural, artistic, health care, entertainment, recreational, traveling, sporting, exercising and other personal needs of persons or communities;
- administering, protecting, and representing society as a whole and its communities; meeting social and communal needs of the society; interest representation; research and development; legislation.

For statistical purposes the following activities are not considered services:

- income-distribution; financial transfers such as interest and dividends; dividing the state budget and its special-purpose funds to chapters and titles; scholarships; transfers for financial and insurance transactions; asset and capital transactions; paying duties, taxes, dues, subventions, damages; social security contributions and payments; fines, fees cash and cash substitutes;
- prohibited or illegal acts (e.g. theft, robbery, smuggling).

2.2.2. DEFINITION OF COMMERCE AND RETAIL TRADE

Services, as shown by the different conceptual interpretations and classification types, are greatly diversified. Thus, I presume that service quality measurement cannot be generalized either. Particular services have different characteristics,

determined e.g. by the purpose of the service or by the quality of the customer-supplier relationship. Taking into consideration the different service typologies, I concentrated on *commerce and particularly retail commerce*, a fundamental area from the aspects of the economy and service quality improvement potentials. Commerce makes products and service available there and then, where and when the customer wants to purchase. At the same time, it is commerce that creates and maintains the distribution channels, stores and transports goods, as well as conveys the information relevant to services and goods between the supplier and the customer (Papp, 2003, pp. 247-252.; Veres, 2005, p. 284).

Within commerce we can differentiate between wholesale and retail trade activities. The most important difference is that the majority of the retailers supply goods to the end consumer, while wholesalers generally sell to retailers. Pursuant to act CLXIV of 2005 on Commerce *wholesale trade* means “reselling products to traders or processors in an unaltered (unprocessed) state; including storing, transporting and providing other direct services related to products, wholesale market and procurement activities.” In comparison *retail trade* means: “selling products and commercial services directly to the customer.”

EuroStat (2007) defines retail trade as “*a form of trade in which goods are mainly purchased and resold to the consumer or end-user, generally in small quantities and in the state in which they were purchased (or following minor transformations)*”.

Pursuant to the 1st amendment⁴ of NACE retail trade includes:

- Retail sale in non-specialized stores;
- Retail sale of food product, beverage and tobacco product in specialized stores;
- Retail sale of medicine and pharmaceutical products, beauty and health care products;
- Other retail sale of unused products in non-specialized stores;
- Retail sale of used products in stores;
- Non-store retail sale;
- Repair of personal and household goods.

Retail trade – similarly to the NACE classification – is divided to three basic categories (Papp, 2003, pp. 260-265.):

⁴ NACE = Nomenclature statistique des Activités économiques dans la Communauté Européenne Ver. 1.

- (1) *Store sale* is the traditional form of retail. There are different type of the stores –depending on their size or the range of goods they sell – specialized store, grocery, supermarket, leisure store, discount store, department store, mall, showroom of catalogue store, plaza);
- (2) *Non-store sale*, which is becoming more widespread. In this retail form products are not sold in the traditional way, that is, in some sort of sale facility, but mostly through some type of agency, that is, indirectly. Such forms or non-store sale includes: mail order sale, electronic sale and television marketing;
- (3) The units of the *retail organization* operate independently, but belong to the same organization and so reduce business risks or their competitive disadvantage against bigger companies. Their most popular forms are: chain stores, franchises or consumer`s cooperations.

Consumers buy the greatest part of the products or services through retail channels (mainly in the store-based retail). Retail trade, besides having substantial economic role, is the area where the buyer-seller interaction is the most intense, thus service quality judgment are the post prevalent in this service form. The above phenomena made me focus on retail service providers in my efforts to develop a decision support system aimed at improving service quality.

2.3. DEFINITION OF SERVICE QUALITY

2.3.1. SERVICE CHARACTERISTICS AND THEIR EFFECT ON SERVICE QUALITY

While consumers can always touch, try or return the product, if it does not meet their needs or the applicable standers, services are more complex in this regard. Let us take a bank client for example, who would like to make a transfer by phone. On one hand the client only “meets” the service for a very short time period, since submitting a transfer order only takes a couple of minutes. There is no real connection between the client and the “product”. By hanging up, the client ceases to have any effect on the processes. He/she does not see how the service is in fact provided, only perceives the results in the form of a debit notice, but has no saying on whether the transfer is made in two days or within the hour. On the other hand while in manufacturing several tests may be completed, in case of services quality

may not be measured without the consumer, which makes quality improvement a lot more complicated task. Table no. 3 presents the most important differences between the manufacturing and the service sphere:

| Attributes | Services | Manufacturing |
|---------------------------------|----------------------------------------|-----------------------------------------|
| Connection with the customer | Direct | Through distributive channels |
| Manufacturing / service control | Limited | Expansive |
| Paper-work | A lot | Few |
| Possibility of failures | A lot | Few |
| Tangibility | Rather intangible | Tangible |
| Indicators of quality | Customer complaints/ declining results | Quality standards |
| Quality improvement | Rather operative | Long term, strategical, well structured |
| Preparedness of customer | No given expectations | Detailed expectations |

Table No. 3.: Differences between manufacturing and service sphere

As shown in the table, services and service quality require an approach different from the approach applied on the production field. The basic indicators are different, just like the central factors that make a given service acceptable or fit. While in case of a specific product long-term fitness, repair or esthetics determine the quality of the performance, these categories – as shown by the previous example – cannot be interpreted relevant to services.

2.3.1.1. INTANGIBILITY

Services are *intangible* and cannot be measured as things, which we can describe or measure with great accuracy. Similarly, the task of comparing services is a more complex and difficult process. Services have no such test factors which would allow the customer to conclude their quality prior to the purchase (Zeithaml, 1981), rather they have to rely on the supplier's information or promises. The customer must trust the service provider and his/her promises. In measuring service quality, *trust plays a more important role* (Papp, 2003, p. 31.). The layman customer is not capable to objectively judge the result of certain services; he/she can only trust that the service was provided at the expected level of quality (auto repair). Other services, such as medical services, accountancy or consultancy, require the customer to transfer confidential information to the service provider.

2.3.1.2. *UNIQUALITY*

The great majority of services are heterogeneous. Service performance varies depending on the time or the service provider. We cannot expect to receive identical services in all banks, shops or gas stations. While the 95 octane number gas is of the same quality at all gas stations (or at least should be), customer service varies at the different stations. Mass services, providing standardized services or results, of course are less unique (e.g. public utility services).

Uniquality basically is the result of the human factor. A smaller or larger part of every service is provided by human beings; their performance is fluctuating in time even under strict supervision and the quality of the services provided by multiple persons depends on the skills all persons. A further hardship is posed by the fact that the person receiving the service is a human being too. Because of the different customer expectations and subjective judgments it is harder to evaluate the quality of the service (Veres, 2005, p. 35.).

2.3.1.3. *INSEPARABLE*

The acts of providing and receiving services cannot truly be separated from each other, that is, they are *inseparable*. While in the course of production, designing or manufacturing, a given product and evaluating thereof by the consumer are separable in time and place; in case of services the consumer perceives service quality at the time of provision via a direct contact established with the supplier. This results in the customer evaluating the quality of the given service concurrently with taking the service, and his/her overall judgment on the service provider is produced by adding up the experience of several purchasing interactions. Inseparability in time and place should be addressed because in case of many services, it is not so clear-cut. For example in case of insurance the purchased insurance service is “used” at a later time, or sometimes never, or in case of internet services and televised sport broadcasts the supplier and the customer need not necessarily stay at the same place. The latter case proves that in these days one group of services has become mobile. At the same time the *mobility* of other services remains restricted (Papp, 2003, p. 32.). These services require that the customer and the service provider are physically connected (for example the hair

dresser, where the hair dresser and the client need to be at the same time to provide the services).

Inseparability of services makes the *role of the customer* more active and direct than in case of production. Services are generally based on the interaction of the service provider and the customer, as opposed to producing a certain product, where the customer at maximum determines his/her expectation by the specifications, but otherwise is not part of the production process. The degree of customer (buyer) participation of course may vary in the different service lines. For example in case of car repair services, the customer does not really get involved in the procedure, because he/she has not expertise, contrary to this, in self-serving restaurants the service is partially provided by the customer.

2.3.1.4. PERISHABILITY

Services not utilized at a certain time cannot be replaced. Due to their *perishable* nature, services not provided today cannot be sold tomorrow. (Zeithaml, Parasuraman, Berry, 1990). For example the theater play performed this evening cannot be seen tomorrow; the entertainment available this evening will not be available tomorrow. Since services cannot be stored, balancing of demand and supply is more challenging.

2.3.2. SERVICE CHARACTERISTICS AND SERVICE QUALITY

Due to specificities of the services, evaluating their quality is extremely difficult. Service quality is *harder to evaluate* for the customers than the quality of products, because the person evaluating the service typically does not have the necessary expertise to do it or there are no objective measures. Customer judgment is rather subjective and it is affected by psychological factors, prior experiences and word-of-mouth. “Considering the above we can conclude that in case of services the popular service quality definition, stating that “quality is good if it is deemed to be good by the customer” is especially true” (Parányi, 2005a, p. 19.).

Suppliers face more difficulty if they want to explore the expectations they have to comply to. In case of some services -such as immaterial service-results like educational or development services- the customer can only circumscribe his/her expectations. “Compliance standards and the success of the performance depend on

the professionalism of the supplier and on the preparedness and attitude of the customer” (Parányi, 2005a, p. 18.).

Service quality is a field of many *ambiguities*. It is hard to define, what we understand under bad and under good service. What makes it more complicated is, that different customers find different features important in the same service. Let us look at a trade company, serving both retail and wholesale partners. Retail customers are likely to appreciate if the service is rendered in an esthetical store, by employees having a decent appearance, proper skills and capable of providing adequate information on the products. Similarly, the customer will value if there is a chance to try the products or use other complementary services (e.g. home delivery). The wholesale partners of the same company will appreciate the service due to other features: proper phone availability, professional information, personalized offers, while physical appearance will have less importance. The generally held “trust elements” and the “experience factors” concluded after the service was delivered, have a substantial impact on service assessment (Hentschel, 1995).

The research results of Zeithaml (1981) also support that in evaluating service quality, customers rely on *experience* and *trust* to a greater degree. The service is evaluated -not only upon its outcome (e.g. the bank transaction was completed)- the process of the service provision will be taken into consideration as well (whether the bank employee was polite, professional, how long the procedure lasted etc.). As opposed to product quality, service quality can only be measure during the process itself. This procedural approach requires that tangible and intangible quality components are interpreted simultaneously. The customer will not be satisfied with the quality, if -although the result of the service is satisfactory,- the procedure itself, is not. Would we consider the performance satisfactory if the hair dresser gives us a nice haircut, but acts in a rude, impolite manner, almost causing pain with the service? Grönroos (1982) describes this feature of service quality in the *technical-functional model* of service quality (see chapter 4.1.2).

2.3.3. APPROACHING SERVICE QUALITY CONCEPTS

Although the service sector makes up a substantial part of the economy, publications chose to address service quality a lot less, than the quality of products or manufacturing processes (Ghobadian, Speller, and Jones, 1994). This is so, because

of the characteristics of the physical products and the services are different and there are many ways to interpret the concept of service quality. While during industrial production the quality (the totality of the products' characteristics) and fitness (features deemed material or the prescribed, determinable and measurable features) may be clearly separated, in case of services differentiation is more complicated.

Parányi describes the interpretation challenge by the following example: "the fitness of the product of tailor shop is presented by a dressed-up, skinny model (standard?!); or in the beauty salon a picture of the fashionable cut is exhibited. Whether the supplier's promise was successfully kept to a larger woman, or in the second case to a woman with a different facial structure, and whether the woman feels that her expectation are met (the product is fit) will depend on her individual – potentially wrong or subjective – judgment" (Parányi, 2005a, p. 18.).

Accordingly, in determining service quality, personal subjective judgments play a more substantial role. Relevant to the above quality-fitness duality, the set of characteristics expected by the individual corresponds to the quality side, and the actual subjective judgment on the material service qualities, to the fitness side. Zeithaml defined perceived quality as: "*the consumers' judgment about an entity's overall excellence or superiority*" (Zeithaml, 1988, p. 3.). This is rather a judgment or a subjective attitude, than an objective concept. Service quality is determined by comparing the expectations with the perceived performance, that is, by disconfirmation. This correlation was the starting point of many researchers (Parasuraman et al., 1985, 1988, 1991a, 1991b, 1994a, 1994b) and one of most accepted service quality models, SERVQUAL, is based on this premise too. The real challenge of defining service quality is originated by the difficulty of determining which characteristics or dimensions should be evaluated by the customer, and by the problems of deciding how to interpret the degree of the given characteristic, that is, the expectations formulated relevant to them. According to the Gap-model the perceived service quality is "*the degree and direction of the discrepancy between consumers' perceptions and expectations*" (Parasuraman et al., 1988, p. 17.). In other words, expectations are clearly determined by the individual customer. Contrary to this Voss, Roth, Rosenzweig, Blackmon and Chase maintained that service quality is "*based on the meeting or exceeding of certain established service standards*" (Voss, Roth, Rosenzweig, Blackmon and Chase, 2004, p. 213). Here the expectations are determined by the supplier, since the

layman customer does not have clear ideas on what he/she can expect (he/she either has exaggerated or minimal expectations towards the service).

There is no agreement as to the characteristics determining service quality. Although the developers of SERVQUAL thought that their dimensions have general validity (Parasuraman et al., 1985), the majority of researchers (Babakus és Mangold, 1989; Carman, 1990; Finn and Lamb, 1991, Cronin and Taylor, 1992, 1994; Saleh and Ryan, 1992; Babakus and Boller, 1992; Bouman and van der Wiele, 1992; Gagliano and Hathcote, 1994; S. Llosa et al., 1998; Dabholkar et al., 2000; Cunningham and Young, 2002) agree, that characteristics may vary based on the service class, and there is no agreement as to the number of dimension constituting service quality either. In the SERVQUAL model Parasuraman, Zeithaml and Berry (1985, 1988), as a result of practical tests (testing carried out with clients of bank-, credit card, broker-, and repair services) have determined the following ten dimensions:

Tangibles: Appearance of the company`s facilities, equipments, staff and communication tools.

Reliability: The company`s capability to provide the promised service in an exact and reliable manner.

Responsiveness: The company`s propensity to assist the clients and provide immediate services.

Competence: The information, knowledge, expertise required to provide the service

Courtesy: Friendliness, respect, attentiveness, politeness.

Credibility: Honorability, honesty.

Security: No risk, no doubt.

Access: Availability, easy access, contact.

Communication: Informing the client in an understandable manner.

Understanding the Customer: Efforts made in order to understand clients.

The statistical analysis of the answers received showed that there is very strong correlation between several factors, which made it possible to simplify the model. The original ten dimensions were reduced to five fundamental ones: competence, courtesy, security, credibility and security correspond to promise/assurance while access, communication and understanding the customer correspond to the dimension of empathy. Based on the SERVQUAL model the five dimension describing service quality are as follows:

Tangibles: Appearance of the company's facilities, equipments, staff and communication tools.

Reliability: The company's capability to provide the promised services in an exact and reliable manner.

Responsiveness: The company's propensity to assist the clients and provide prompt services.

Assurance/promise: The information, knowledge, politeness of the employee's of the company and their capability to convey trust and reliability towards clients.

Empathy: Personal, careful attention given to clients.

It is interesting that in the course of theoretical and practical debates related to the model (in details see chapter 4.2, 4.3) from the five dimensions only three were kept (Parasuraman et al, 1991a).

Of course, it is also relevant, whether service quality is interpreted in a general context or relevant to a given transaction. While the former definitions addressed a rather comprehensive judgment, Chia – in his summary definition based on literature research – held that “*service quality perception is a comparison of consumer expectations with actual performance*” (Chia et al., 2002, p. 3.).

One of most important questions in connection with interpreting service quality is: whether the expectations have to be interpreted in an explicit manner, or simply measuring the individual characteristics (promises in connection with fitness) would suffice. The latter theory is supported by research results from Cronin and Taylor (1992, 1994), Teas (1993, 1994), Liljander and Strandvik (1994), and Dabholkar (2000), concluding that service quality is the quality perceived by the customer.

The above paragraphs show that it is difficult to provide an unambiguous definition for service quality. In developing the retail service quality model and the decision support system, I defined service quality by synthesizing the definitions of the professional publications. Accordingly, service quality means: *the value judgment of the customer relevant to the performance of the supplier. It is determined in a comprehensive manner or based on particular dimensions, depending on the service sector.* Thus, quality judgments are formulated on multiple levels. First a general picture is formulated on supplier. Second, evaluation is rendered pursuant to the quality dimensions of the given service sector. The customer formulates the judgment *based on perceiving the* supplier's performance. The above does not

contradict the accepted quality definition, since the customer includes his/her implied expectations in the evaluation.

3. THE ECONOMIC IMPORTANCE OF SERVICE QUALITY RESEARCH

In the next chapter I would like to substantiate the economic importance of the subject matter of my thesis: retail service quality and a decision support system aimed at improving retail service quality.

The economic significance of the services, particularly retail trade, is continuously growing worldwide. According to the latest economic researches and indicators (ISO Survey, 2006; EuroStat, 2007) a substantial part of the economic activities takes place in the service sector and this tendency is likely to continue. I am intending to show the relevance of quality in the service sector on the basis of international research (Saizarbitoria, 2006), ISO 9001's quality-management system` growing popularity and the frequency of its application; proving that quality consciousness has achieved continuously growing relevance in economic organizations.

At the same time, the question is: whether it is worth it for suppliers to address the issues of quality and quality improvement and whether it ever produces tangible results. Several international researches were conducted in this regard (e.g. Buzzel and Gale, 1987; Fornell, 1992; Zeithaml et al., 1996; Ittner and Larcker, 1998, Cronin et al., 2000; Dabholkar et al., 2000; Olorunniwo et al., 2006) that proved that a positive connection exists between service quality and organizational quality. The last third of this chapter is devoted to this analysis. I present an outline of the most important research data on the relation of service quality and organizational performance / efficiency, and my empirical research conducted in 2007 with the participation of ISO 9001 certified small and medium Hungarian service companies. My conclusions drawn from these results prove the significance of my subject: it is worth it to invest in service quality and service improvement since higher service quality level results in higher organizational efficiency.

3.1. SERVICES IN THE ECONOMY

Breaking the centuries-long hegemony of industrial production, the importance of service in the economy has increased. Not only the number of workers employed in the service industry have increased substantially, but companies, formerly only

engaged in manufacturing, has set up special divisions engaged in sales and customer service. A detailed discussion of the role of services in the international or the Hungarian economy exceeds the frame of this paper (such analysis is available in the works of Papp (2003), Fitzsimmons and Fitzsimmons(2004)), I rather concentrate on the tendencies of the previous years.

In the USA in 2002 80% of the GNP was produced by the service sector (Fitzsimmons and Fitzsimmons, 2004), by 2005 the rate of the service sector in the world economy grew by 16%, that is, by USD 2.1 billion (ISO Survey 2005).

In the economy of the EU the previous years brought about a major structural shift toward the service sector. In January 2004 the EU, in a directive on improving competitiveness and the European economy, set the target of cross-border service development. One of its results is that by 2006 within the 25 members of the European Union 60-75% of the total economic production is originated by providing services (EuroStat, 2007).

Similarly to world tendencies, the structure of the Hungarian economy has drastically changed. „Between 1989 and 2001 rate of agricultural production in the GDP dropped from 15 % to 4 %, industry`s from 34 % to 28 %, while the that of the services grew from 42 % to 67 %. It means that Hungary has indicators similar to other developed societies and entered the era of the postindustrial society (Palánkai, 2007). A further growth is expected from the accession. Both in the EU and in Hungary, the rate of agricultural and industrial production is continuously decreasing in terms of contributing to gross added value⁵, while the rate of services is increasing. This tendency is caused by information economies and information-based societies gaining ground and, of course, by globalization. When information-technology emerged, new service lines came into existence, generating newer - presumed or real – demands. This tendency is not expected to change: in the information and knowledge based societies, emphasis is shifted towards consumption-like informational services and newer and newer service lines are created.

⁵ Gross added value: the difference between the output value produced by the sectors (production value) and the value of products and services consumed during production (current production consumption). In calculating the gross added value, the output is valued at the base price while the current production consumption on market purchase price (www.ksh.hu).

Figure no. 4 shows the contribution of the given sectors⁶ to gross added value relevant to the EU-25 countries in 2005 (EuroStat, 2007). It must be pointed out that the contribution of business and financial services to gross added value was close to 25%. The rate of commerce, transportation, communication services is similarly high (21.7%) and other services’ – including all public services, education health care and other communal, social and other services – is (22.5%). In comparison, the 2004 Hungarian data show that rate of other services is the highest (25.7%), followed by the processing industries (22.5%), and financial and other economic services (20.6%). The most substantial difference is manifested due to agriculture, the rate of which is twice as high as the EU average rate.

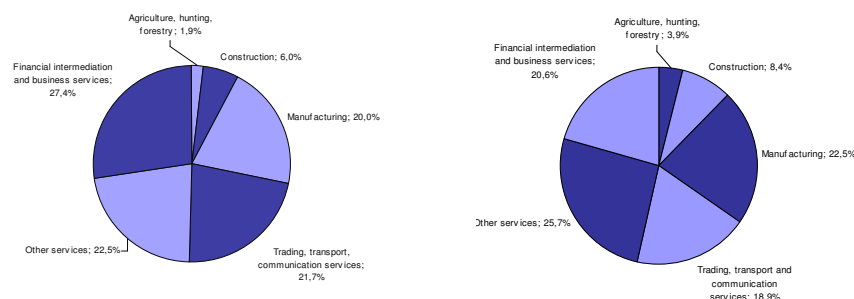


Figure No.4: Breakdown of given service sectors to gross added value relevant to the EU-25 countries (in 2005) and in Hungary (in 2004), in percentage
 (Source: EuroStat, 2007; KSH, 2007)

The continuously increasing relevance of services is indicated by the fact that between 2000 and 2005 the increase of the yearly average turnover rate was between 3 and 6 percentage (Figure no. 5.) Services connected to financial services, IT and communication produced the most substantial increase, and wholesale and retail trade too produced a yearly average 3% increase (EuroStat, 2007). This major development of IT related services was facilitated by outsourcing becoming more and more popular. It is expected that companies will outsource more and more services to subcontractors, thus further increasing the rate of the service sector in the economy.

⁶ The sectors are classified based on NACE 1. Issue (Nomenclature statistique des Activités économiques dans la Communauté Européenne Ver. 1.)

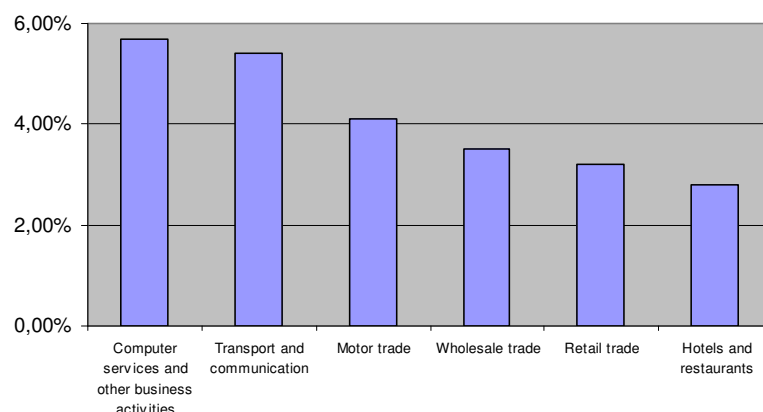


Figure No.5: Average annual growth rate of turnover, selected service activities, 2000-05, EU-25 (%) (Source: EuroStat, 2007)

The number of persons employed in the service sector (Table no. 4) and the rate of that to the full employment (Table no. 5) is continuously increasing worldwide. In 2003 in the EU this rate approached 70%, while in the USA it almost reached 80% (Fitzsimmons and Fitzsimmons, 2004).

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Austria | 2358 | 2380 | 2423 | 2433 | 2461 | 2509 | 2550 | 2595 |
| Czech Republic | 2550 | 2567 | 2567 | 2614 | 2621 | 2637 | 2679 | 2700 |
| USA | 99277 | 101853 | 102799 | 103545 | 106810 | - | - | - |
| Finland | 1506 | 1541 | 1582 | 1597 | 1615 | 1633 | 1658 | 1693 |
| France | 16492 | 17053 | 17425 | 17654 | 17757 | - | - | - |
| Hungary | 2183 | 2253 | 2258 | 2269 | 2368 | 2371 | 2398 | 2426 |
| Great-Britain | 20015 | 20506 | 20790 | - | - | - | - | - |
| Germany | 22741 | 23077 | 23380 | 23454 | 23579 | 23888 | - | - |
| Italy | 12608 | 12987 | 13333 | 13585 | 13728 | 14287 | 14484 | - |
| Spain | 9111 | 9672 | 10048 | 10464 | 11003 | 11518 | 12335 | 12968 |

Table No. 4.: The number of persons employed in the service sector (1000 persons) (Source: www.oecd.org)

The trends we see in Hungary are very similar to the Union and the global trends. The rate of the number of workers, employed in the service sector and that of all employees has been substantially increasing from 2000, and by 2003 it reached approx. 62 %. In 2006 almost two and a half million workers found employment in this economic sector (see Table no. 5).

This transformation of the employee-structure, namely the move of the work force from the production sector to the service sector, is expected to continue. This is due to – besides creating more and more knowledge-based positions – the phenomena

that employees often do not undertake jobs in the production sector requiring hard physical labor (Papp, 2003).

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| EU-15 | 67,5 | 68,1 | 68,4 | 68,7 | 69,4 | 69,9 | 70,3 | 70,9 | 71,4 |
| EU-25 | | | | 66,0 | 66,9 | 67,5 | 67,9 | 68,7 | 69,2 |
| Czech Republic | 51,6 | 52,3 | 53,1 | 53,5 | 54,7 | 55,4 | 55,2 | 55,5 | 56,1 |
| Denmark | 70,9 | 71,3 | 71,8 | 72,2 | 73,0 | 73,3 | 73,6 | 74,1 | 74,5 |
| Finland | 65,1 | 65,5 | 65,5 | 65,9 | 66,0 | 66,4 | 67,1 | 68,0 | 68,9 |
| France | 70,9 | 71,5 | 72,0 | 72,5 | 73,1 | 73,4 | 73,5 | 73,9 | 74,3 |
| Ireland | 60,3 | 61,1 | 61,0 | 62,2 | 62,8 | 63,3 | 63,8 | 65,0 | 65,8 |
| Poland | 45,4 | 46,2 | 47,5 | 48,8 | 50,6 | 50,4 | 50,4 | 52,0 | 53,0 |
| Hungary | 58,8 | 58,6 | 58,6 | 58,0 | 58,7 | 59,5 | 59,4 | 59,7 | 62,3 |
| Great-Britain | 76,4 | 76,7 | 76,6 | 76,6 | 77,6 | 78,3 | 79,2 | 80,0 | 80,4 |
| Germany | 64,3 | 65,4 | 66,2 | 66,8 | 67,7 | 68,4 | 69,0 | 69,7 | 70,3 |
| Italy | 63,0 | 63,8 | 64,0 | 64,3 | 64,9 | 65,5 | 65,8 | 66,2 | 66,5 |
| Spain | 64,0 | 63,9 | 63,8 | 63,9 | 63,9 | 64,2 | 64,1 | 64,6 | 65,3 |

*Table No. 5.: Persons employed in service related to full employment
(Source: www.econ.core.hu)*

3.1.1. THE ROLE OF RETAIL WITHIN THE SERVICE SECTOR

Commerce is a fundamental service group. It is connected to distributing goods, plays a transforming role. It organizes and implements product exchange and distributes work (Papp, 2003, p. 247.).

The statistics-based definition of commerce focuses on the distributive nature. EuroStat (1996) defines retail and wholesale commerce (supplemented by vehicle motor and household goods repair) as *distributive trade*, and evaluates statistical data on the basis of this classification. Both international and Hungarian data indicate that commerce has significant role in the economy.

Pursuant to KSH data, 21% of the business associations operating in Hungary were engaged in trading in 2004. The distributive trade contributed to gross added value between 2001 and 2004 by 11 % of the production (KSH, 2007). Retail and wholesale trade alike grow without setbacks.

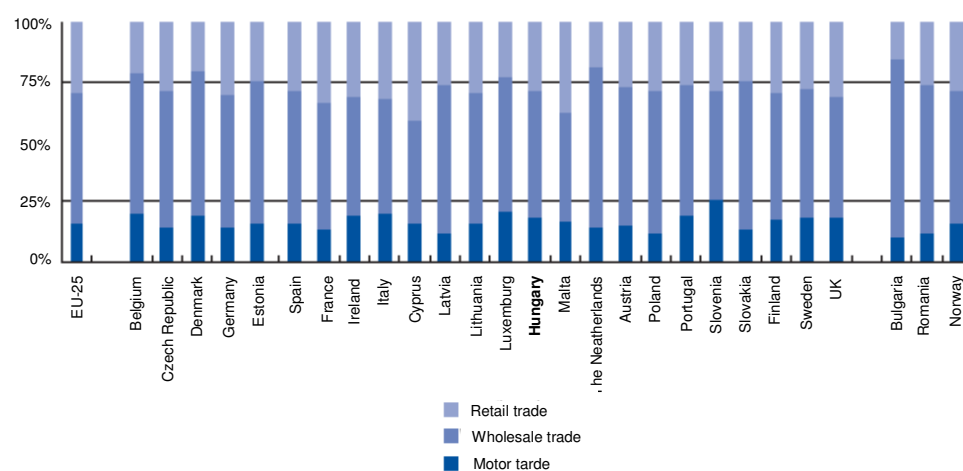


Figure No.6: Breakdown of turnover within distributive trades, in 2003
(Source: EuroStat, 2007)

The average turnover growth rate of both commercial form exceeded 3% between 2000 and 2005. (EuroStat, 2007). The workforce demand of the retail trade is the highest within distributive trade (see Figure 7.). In the 25 countries of the European Union – similarly to Hungarian data – more than 50% of the workers employed by the distributive trade worked in retail in 2003 and made up more than one third of the whole turnover (see Figure 6.).

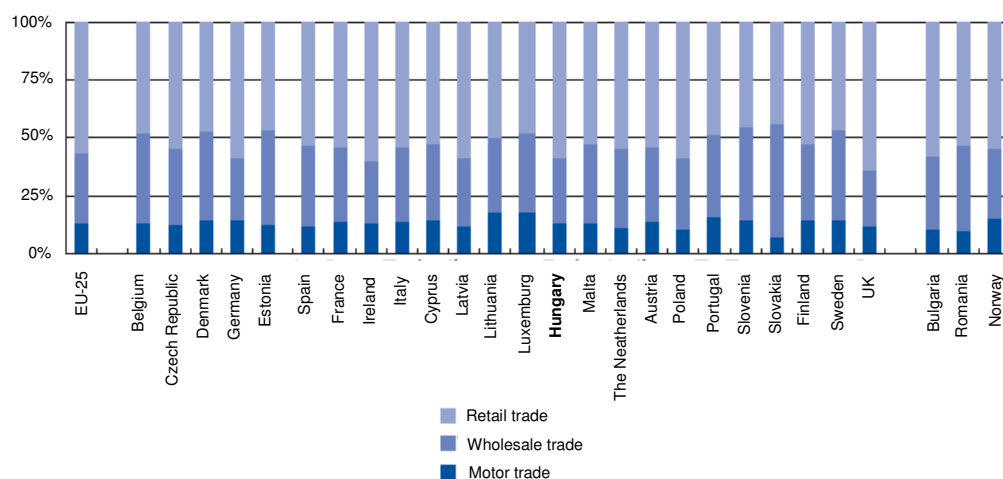


Figure No.7: Breakdown of employment within distributive trade, in 2003
(Source: EuroStat, 2007)

3.2. QUALITY IN SERVICE ORGANIZATIONS

The last decade of the twentieth century was characterized by quality-consciousness becoming more and more widespread in Europe. At first the effects were reduced to the industrial sector, but the technologies, methods and standardized systems

developed gradually overtook newer economic areas, such as the financial, educational and health care sectors. In Europe quality-consciousness and quality-conscious business-management became popular because of the standardized quality control systems (ISO 9000) and the EFQM⁷ excellence model. It needs to be stressed that standardized systems gained worldwide recognition at the beginning the 90`s, in 1996 62% of the number of certificates issued were concentrated to Europe (Saizarbitoria, 2006, p. 115.). From this millennium more and more certifications have been issued in far-east countries too, and between 2001 and 2005 the contribution of the European countries became stabilized around 49% (ISO Survey 2005). Arana (2003) in his study compared the % rate of the number of certificates, issued in a given country and that of total number of certificates issued in Europe, with the contribution of the given country to the GDP of the EU. His results (Figure no. 8) show that in 2003 Hungary, Malta and the Czech Republic were the most intensively developing countries.

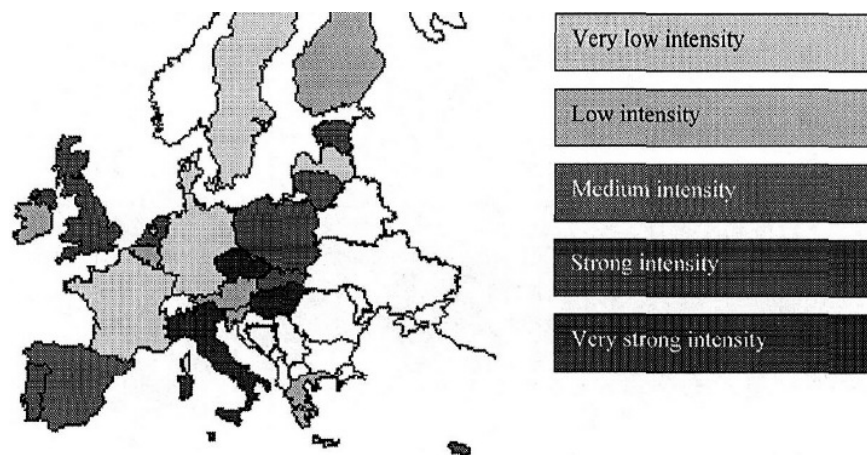


Figure No.8: Certificate intensity in the countries of the EU-25 in 2003
(Source: Saizarbitoria et al., 2006, p. 115.)

This tendency is supported by the latest survey of ISO (International Standards Organization) (Figure no. 9). Although the increase of the number of the certified organizations has slowed down globally (while in 2003 the number of certificates was nearly three times more than the number of the last year, in 2005 the increase was a „mere” 18%), in 2005, 776.608 certifications were issued in the 161 countries of the world.

⁷ EFQM – European Foundation for Quality Management

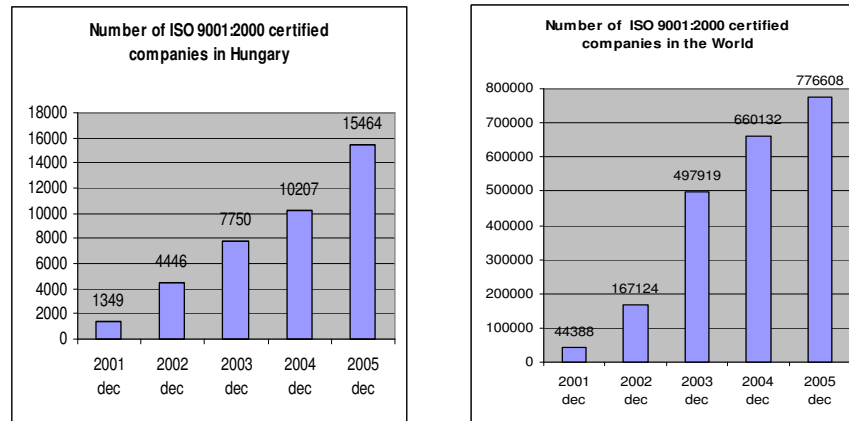


Figure No.9: Number of ISO 9001 certificates in Europe and in Hungary, 2001-2005
(Source: ISO Survey 2005)

It should be stressed that in Europe Italy has the leading position (98.028 certified organizations); Hungary occupied the sixth rank on the chart in 2005 with 15.464 certifications (ISO Survey 2005), and beside Italy, it is only surpassed by developed economies as Spain, the United Kingdom, Germany and France.

The results of the research indicated that the global economic tendencies, like the increasing importance of the service sector, are manifested in the area of quality as well: in 2005 nearly 33% of the ISO 9001 certifications were issued in the service sector (ISO Survey 2005). This signifies that quality-consciousness and quality need to invade the procedures used by businesses of the service sector.

3.3. THE CONNECTION OF SERVICE QUALITY AND ORGANIZATIONAL PERFORMANCE

Prior to developing a decision support system aimed at improving retail service quality, we have clarified the relevance of studying service quality and a connected decision support system. We have to determine, whether this research field has any economic significance and whether it contributes to improving the performance of the service organizations. Grandzol and Gershon (1997) have found, *that in the United States more than 50% of the expenses spent on training, was spent on quality-related trainings*. In light of this, decision makers, understandably, want to see whether quality improvement programs are in fact useful and whether they impact the price income, return on investments, customers numbers as well as loyalty (Sousa and Voss, 2002).

The important effect of service quality on performance and the relevance of the research are supported by the results of the research conducted by Wimmer et al. (2006) by enrolling Hungarian based and owned medium companies. Managers held that the most useful performance indicators are: product- and service quality, as well as customer satisfaction (see Table no. 6).

Zeithaml, Berry and Parasuraman held that exploring the correlation between the performance of companies and the quality perceived by the customer is an „*issue of highest priority*” (Zeithaml, Berry, Parasuraman, 1996, p. 31.). They presumed that increasing service quality would result in growing customer satisfaction and loyalty, thus decreasing expenses and eventually a better financial situation. This premise, however, has not been verified up to this day. (Das, Handfield, Calantone and Gosh, 2000). The positive connection between service quality and organizational performance was supported by further researches as well (e.g. Buzzel and Gale, 1987; Fornell, 1992; Ittner and Larcker, 1998, Cronin et al., 2000; Dabholkar et al., 2000; Olorunniwo et al., 2006), others, however, proved the exact opposite (Grandzol and Gershon, 1997; Ittner, Larcker and Meyer, 2003).

| Indicator/method | Users (in %) | Average score | Aspect of indicator/method |
|------------------------------------------|--------------|---------------|-----------------------------|
| Product/service quality | 77,2% | 4,62 | Performance, quality |
| Customer satisfaction | 65,2% | 4,50 | Customer service |
| Productivity | 77,7% | 4,32 | Performance, thrift |
| Accuracy in order accomplishment | 61,2% | 4,32 | Customer service, time |
| Quality of supplier's services | 65,5% | 4,28 | Performance, quality |
| Accuracy of production line | 72,2% | 4,23 | Performance, accuracy |
| Accuracy of suppliers | 61,9% | 4,18 | Performance, time |
| Number of customer complaints | 77,9% | 4,15 | Customer service |
| Production time | 71,3% | 4,15 | Performance, time |
| Accuracy of stock-records | 69,1% | 4,11 | Performance, accuracy |
| Speed of handling of customer complaints | 55,2% | 4,11 | Customer service, time |
| Length of order accomplishment | 55,8% | 4,07 | Customer service, time |

*Table No. 6.: The most useful performance indicators
(Source: Wimmer et al., 2006.)*

Below I would like to clarify how I define organizational performance for the purposes of this thesis, and how the quality-satisfaction-performance factors are connected. Subsequently, through the *market and production/manufacturing* mechanism and by reviewing relevant professional literature, I explore the effect of sq on organizational performance.

3.3.1. THE DEFINITION OF ORGANIZATIONAL PERFORMANCE AND ITS CONNECTION TO QUALITY

The relevant professional literature contains several definitions of organizational performance. Griffin (2003) maintains that organizational performance should be *described as the extent to which the organization is able to meet the needs of its stakeholders and its own needs for survival* (Samat et al., 2005, p.4.). Accordingly, he does not equate performance with a high profit rate or substantial market share; these indicators are derived from the definition of performance. He argues that organizational performance is influenced by several factors, and their different combinations may improve or reduce performance. Such factors are among others, service quality and customer satisfaction.

Several researchers identify organizational performance with organizational efficiency (Chu-Hua, Madu, Lin, 2001; Terziovski and Samson, 1999); others describe organizational performance by performance indicators. These instruments are very useful for the empirical research and for measuring, because profitability (Rust et al., 1995), purchasing propensity (consumer behavior) (e.g. Parasuraman et al., 1996; Cronin and Taylor, 1992; Cronin et al., 2000), rate of keeping customer (Ranaweera, Neely, 2003), rate of loyal customers (Mittal, Kamakura, 2001), rate of investment proportional return (Schmidt, 1992) are easy to examine (although the generalization potential is restricted) thus may be used for measuring organizational performance.

The literature (Gale, 1994; Cook and Verma, 2002) identifies two explanatory mechanisms relevant to connection of quality and organizational performance:

(1) *Market mechanism* is primarily focused on the fact that quality improvement results in increasing revenues, and thus the company realizes higher profit. Customers, in making purchase decisions compare the perceived quality of the products/services offered by the different companies competing with each other, and choose the one best suiting their needs. By improving quality the supplier/producer can acquire new buyers, can acquire or strengthen the loyalty of the existing buyers or can seduce the customers of competing companies, who find that the product or the service of the competition is of lesser quality (Gale, 1994). Customers are willing to pay more for better quality. Improving quality, thus increases revenues, market share and results in higher profit. (Sousa and Voss, 2002).

(2) The *production/manufacturing mechanism* holds that by improving the quality of the planning phase of manufacturing processes, losses are decreased and by refining internal procedures, the efficiency of the operations is enhanced. If quality is improved, the rate of returned products, complaints and reclamations drops, and thereby the company needs fewer employees who repair defective goods. These tendencies will later appear in the financial performance of the company too, since costs are decreasing, reliability of the products is increasing, and finally the products will be a lot more attractive for the consumers as well.

3.3.2. RESEARCHES ON THE QUALITY-SATISFACTION-OPERATIONAL PERFORMANCE CORRELATION

Researchers disagree as to the effect of the perceived service quality and consumer satisfaction on the financial performance of the company. (Zeithaml et al., 1996; Bernhardt et al., 2000). The inconsistent results of the researches conducted on exploring the connection between service quality and organizational performance are mostly caused by the complexity of the quality-satisfaction-performance correlation (Babakus, 2004) and by the ambiguous interpretations of the definitions and their causal connections⁸. Buzzel and Gale (1987), by applying the relative quality theory (the quality is judged by the customer) proved that quality and market share has a positive connection. Contrary to the above, Revees and Bednar (1994) defined quality as the degree of the product or the service` excellence, and proved that quality, due to higher production costs, has a negative impact on market share.

Just like service quality, customer satisfaction was approached from different directions. Hofmeister et al. (2003, p. 35.) held that satisfaction may mean:

- a subjective comparison between the expectations and the experienced service,
- a shopping experience as a discrete service event and a connection with the supplier,
- an emotional condition.

The studies, conducted by Yi (1990), found that pursuant to the result-oriented and the process-oriented aspects of satisfaction, there are approximately eleven different

⁸ The correlations of quality and satisfaction are also discussed in chapter 4.3.10

definitions⁹. Pursuant to the *result-oriented* definitions (Howard, 1977; Westbrook and Reilly, 1983; Strauss and Seidel, 1995; Churchill and Surprenant, 1982) satisfaction is originated by specific consumption related experiences, causing emotional reactions. The *process-oriented* theory rather emphasizes the service or production process as determined by perceptive, sensory and psychological phenomena (Tse and Wilson, 1988; Hunt, 1977).

Researchers have set forth two major theoretical approaches relevant to the *cause-result relation* between quality and satisfaction. One holds that consumer satisfaction is the positive judgment of the customer on the quality of the services, which may be effected by quality related management decisions (Cronin and Taylor, 1992; Dabholkar et al., 2000; Das et al., 2000). The connection is described by the following flow chart:

perceived quality → *customer satisfaction* → *organizational quality*.

The other theory is based on the premise, that the customer's satisfaction/dissatisfaction experience determines the perceived quality of the service (Bitner, 1990; Bolton and Drew, 1991). This statement presumes that the consumer's emotional condition formed relevant to the supplier, effects his/her quality judgment. In other words, the perceived service quality is derived from emotional reactions, manifested as satisfaction or dissatisfaction. The customers who had positive feelings while they the service was delivered, find the quality to be higher, while those, feeling dissatisfied find that quality is poorer. Satisfied customers accordingly give good ratings to quality. Based on this approach the correlation is:

consumer satisfaction → *perceived quality* → *organizational performance*.

In Bagozzi's (1992) theory, the fact whether the customer feels satisfied or dissatisfied determines his/her behavior, thus influences the size of customer base and the frequency of purchases and thereby eventually impacts the performance of the supplier. This is quality → consumer satisfaction → loyalty is such a progressive cause-result line, which leads to a loyal customer base (Oliver, 1999), and thereby better performance.

⁹ The theorhetical premises of consumer satisfaction is summarized by the works of Hofmeister et al. (2003)

The majority of the researches conducted on correlation between service quality and organizational performance were based on the market mechanisms, but the quality-performance relation can be accessed on the basis of the production/manufacturing procedure as well.

3.3.2.1. *MARKET-BASED RESEARCH*

Although Buzzle and Gale have indicated in 1987 that quality and profitability can be related, the research of this only intensified from the beginning of the nineties. Early results already proved that customer satisfaction and purchasing intent, service quality and re-purchasing intent, as well as service quality and market share, have a positive correlation. (e.g. Bolton and Drew, 1991; Fornell, 1992; Rust et al., 1992; Anderson and Sullivan, 1993; Boulding et al., 1993; Kordupleski, Rust, Zahorik, 1993; Fornell et al., 1995; Ittner and Larcker, 1996; Rucci et al., 1998; Roth et al., 2000). Further researches proved, that higher service quality leads to better organizational performance (Golhar and Deshpande, 1999; Kroll, Wright, Heines, 1999, Samat, Saad, Ramayah, 2005).

Strauss in his study examined the connection between the satisfaction of banking clients and the financial performance of the bank (Schmid, 1992). He experienced that there is a strong relation between the two factors. First due to the so-called *quantity effect*, if there are more satisfied customers, the demand for the service will increase too, because the customers spread the news of the high quality service and thus more and more „consumer” will visit the bank. Second due to the so-called *price-effect*, customers who are satisfied on the longer term are less price-sensitive. It means that they will accept a bit higher commissions or smaller interest on their deposited money.

Pursuant to the survey, conducted in the beginning of the 90`s among the customers of major European banks (Table no. 7) the satisfied customer:

- is more loyal,
- wants to strengthen its business contact with the bank,
- recommends the bank to relatives and acquaintances.

| Degree of satisfaction | Customers (%), who | | |
|------------------------|--------------------------------------------|-------------------------|------------------------------|
| | want to make an end of business connection | have the extra services | recommend the bank to others |
| Very satisfied | 3% | 15% | 77% |
| Satisfied | 8% | 7% | 64% |
| Unsatisfied | 55% | 1% | 8% |

Table No. 7.: Degree of satisfaction (Source: Schmid, 1992.)

The surveys have finally concluded, that there is a linear correlation between satisfaction and income-growth, that is, a 10% rise in the customer satisfaction usually results in a 10-15% income increase.

Based on the data of a survey on five major Swiss banks, and further examining the connection between customer satisfaction and banking results, researchers found that quality, (based on measurable and calculable data) has a major impact on the performance of the bank (Figure no. 10). Satisfied customers have less complaints relevant to the banking services, as indicated by the high negative value of the regression coefficient between satisfaction and the number of complaints. Satisfied customers are also loyal too; there is an almost unambiguous connection between the two indicators. The more loyal the customer is to the bank, the more often he/she will make repeated purchases, that is, turn to the bank with its financial service needs. Based on the *Swedish Customer Satisfaction Barometer* the following results are gained by regression calculation:

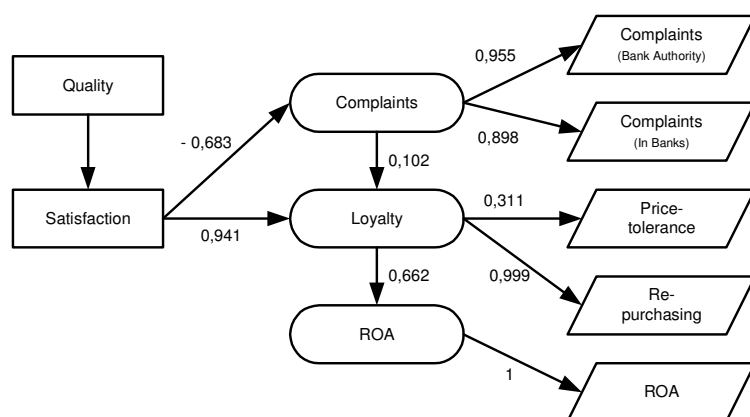
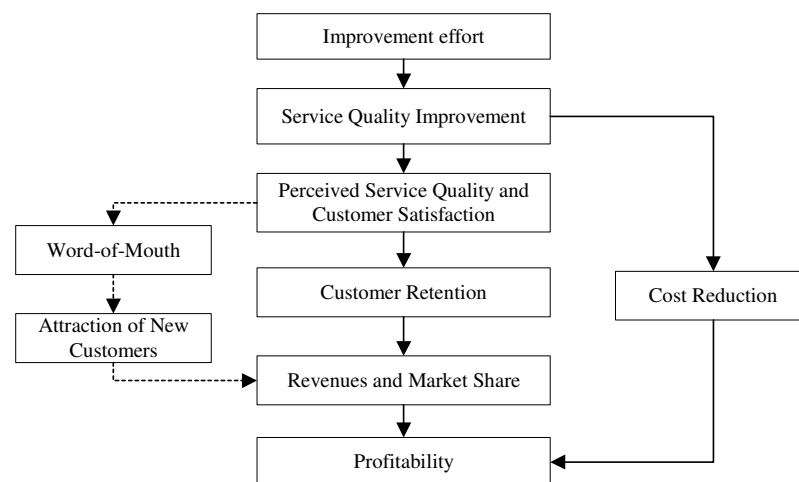


Figure No.10: Correlation between satisfaction and ROA (Return On Asset)
(Source: Schmid, 1992.)

Quality improvement is focused on increasing satisfaction, and through this, reducing costs, increasing profitability and improving the employees` wellbeing and thus long-term profitability. By jointly applying these tools, the goal of long-term profitability can be reached. (Schmid, 1992)

Grönroos (1991) argues that quality improvement has dual advantage for the supplier and the customer as well: the supplier can sell its products above the average market price and reduce its administrative expenses; the customer can reduce its contact costs and save the expense of a brand change.

The model of Rust-Zahorik-Keiningham (1995) ROQ (Return on Quality) shows the correlation between quality improvement and profitability (Figure no. 11).



*Figure No.11: The ROQ (Return On Quality)-model
(Source: Rust-Zahorik-Keiningham, 1995, p. 60.)*

Their premises are:

- “quality is an investment,
- quality efforts must be financially accountable,
- it is possible to spend too much on quality, and
- not all quality expenditures are equally valid” (Rust et al., 1995, p. 59.; Veres, 2005, p. 74.).

The model holds that effective quality improvement measures lead to improved quality, which will result in higher perceived service quality, consumer satisfaction and a likely opportunity to reduce costs. If customer satisfaction increases, more and more customers will be kept and these customers will recommend the organization

more often (word of mouth). The increase of income and that of the market share are originated by the growing number of loyal customers and the new customers seduced via recommendations (word of mouth).

The model of Berry and Parasuraman (1991) on service quality focuses on the expectations. To achieve the objective: the highest possible degree of loyalty, it is not enough to „merely satisfy” the customer`s expectations, those must be over-performed.

| | Customer perception (Level of expectations) | MSA – measure of service adequacy, MSS – measure of service superiority | Competitiveness |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------|
| Desired (ideal) service | <div style="text-align: center;"> Perceived service ▼ Desired service ▲ </div> | MSA = positive MSS = positive | Customer loyalty (customer franchise) |
| Zone of tolerance | <div style="text-align: center;"> ▲ Perceived service ▼ Adequate service ▲ </div> | MSA = positive MSS = negative | Competitive advantage |
| Adequate (satisfactory) service | <div style="text-align: center;"> ▲ Perceived service ▲ </div> | MSA = negative MSS = negative | Competitive disadvantage |

*Figure No.12: Customer expectations and competitiveness
(Source: Veres, 2005, p. 76.; Berry-Parasuraman, 1991.)*

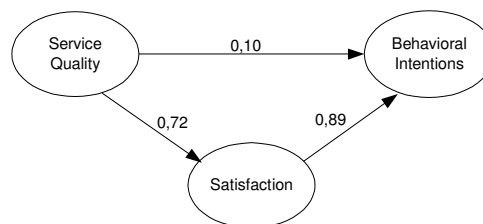
Competitive advantage will be gained if the performance perceived by the customer is rendered in the range of the adequate and the desired services (the customer tolerance zone); and if the expectations towards the desired service are over-performed, the customers will award the performance by loyalty (Figure no. 12). The level of expectation is based on a number of external and internal factors, for example it is influenced by the supplier`s promises, preliminary information, individual characteristics (subject) and the availability of alternative services, etc. (Veres, 2005, p. 75.)

The majority of the researchers (Cronin and Taylor, 1992; Cronin et al., 2000; Dabholkar et al., 2000) agree, that service quality and customer satisfaction positively impact purchasing intent. Zeithaml et al. (1996) have proved that there is a positive correlation between overall service-quality and price-sensitivity. The opinions differ as to whether service quality has a direct or indirect effect on performance, or whether this correlation is generally true in all service sectors.

Cronin et al. (2000) have concluded that among the examined service fields: in the field of mass sport, leisure sport, entertainment services, fast food restaurants services; customer satisfaction and customer behavior (purchasing intent) have a positive and significant connection. They could not establish the direct connection only in field of health care and transport services.

Although the research of Berács-Keszey-Sajtos (2001), conducted among Hungarian companies, has not found a clear connection between operational performance and satisfaction with the company; they have seen that the connection between customer satisfaction and loyalty is strong. Similarly, Mittal and Kamakura (2001) in the course of their research in the automobile industry aimed at repetitive purchase habits, pointed out that customer satisfaction has a strong, direct effect on loyalty. Babakus`s (2004) research, conducted with the participation of the 1100 units of a wholesale network, proved that customer satisfaction mediates between perceived service quality and the performance of the supplier. He also substantiated that customer satisfaction originates from perceived service quality and that it effects business performance through customer satisfaction.

Olorunniwo et al. (2006) in a research aimed at restaurant services, pointed out the service quality has a significant, direct and indirect impact on behavioral intentions. The standardized coefficients showed (Figure no. 13) that this connection is stronger if established through satisfaction.



*Figure No.13: Correlation between service quality and behavioral intentions
(Forrás: Olorunniwo et al., 2006, p. 69.)*

Rust, Zahorik and Keiningham (1995) took the stand, that quality improvement`s use is manifested in two ways. First, as the reputation of higher quality is spread, the organization contacts more and more new customers (offensive marketing strategy), second, if the customers are more satisfied with the service, they will purchase the service more often (defensive marketing strategy). Many researchers (Dawkins and Reichheld, 1990; Payne and Rickard, 1993) thought, that a slight raise

of the number of customer successfully kept, can result in the drastic increase of the organization's profit. This is so, because the regular customers buy more than the new buyers (Rose, 1990), the organization is able to treat them with higher efficiency (they know them), and last but not least, it is cheaper to keep old customers than acquire new ones.

Ranaweera and Neeley (2003) during analyzing the connection of phone companies and their clients pointed out that – even in service lines where the rate of the customer-supplier interaction is low – there is a positive relation between service quality and keeping customers. Needless to say service quality is not the only thing that customers consider; price plays a role in purchasing decisions too. Irrespective of how high the perceived quality of the service is, if it is matched with unacceptably high prices, that the customer (at least the very price sensitive ones) cannot afford, they probably will not stay with the supplier. At the same time in case of low price sensitivity „*service quality improvements can lead to a significant increase in rate of retention*” (Ranaweera and Neeley, 2003, p. 244.).

3.3.2.2. *PRODUCTION/MANUFACTURING MECHANISM BASED RESEARCH*

Quality-awareness may be manifested by organizations by following the total quality management theory (TQM) or standardized quality management systems (e.g. ISO 9001:2000). The major areas of quality management such as: researching demands, regulating procedures, correcting and preventing problems and continuous development all points to customer satisfaction and performance:

Exploring customer demands adequately → post-completion supervision is reduced
→ customer satisfaction grows,

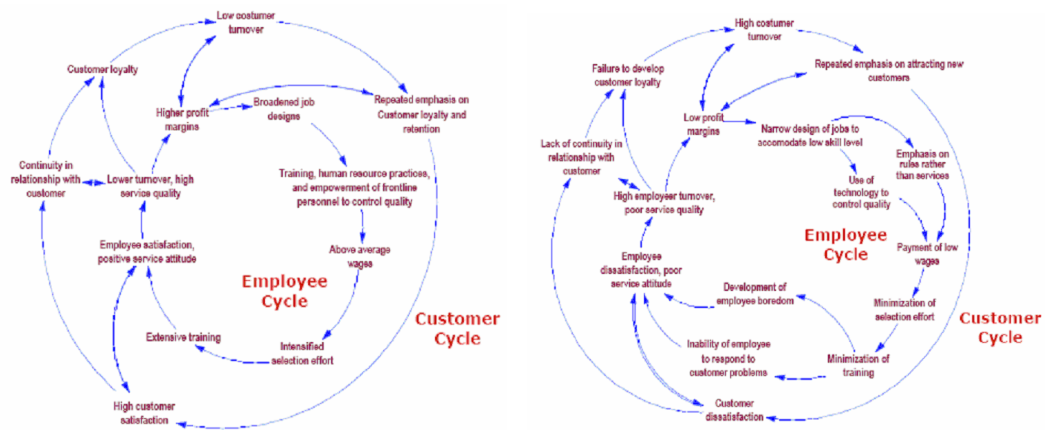
Regulating procedures (measurement, control) → supplementary work quantity is reduced → co-workers are better motivated,

Corrective, preventive measures → the number of uncomfortable situations is reduced → result/profit grows,

Continuous improvements → customer complaint number is reduced → performance is increased.

In Veres's marketing-based approach, the objective of quality management is: by stabilizing and /or improving the service quality judgment of buyers, enhancing

satisfaction (Veres, 2005, p. 70.). The objective of the 2008 draft version of the ISO 9001 quality management standardized system is in line with the above: organizations should improve customer satisfaction and efficiency by applying quality management systems (ISO/CD 9001).



*Figure No.14: Cycle of Success – Cycle of Failure
(Forrás: Veres, 2005, pp. 72-73.; Schlesinger-Heskett, 1992., p. 311.)*

Pursuant to the cycle of success – cycle of failure of Schlesinger-Heskett (1992), quality management's purpose is to reverse the trend of the cyclic unsuccessful periods (satisfaction, loyalty, profitability etc.) (Figure no. 14).

Cook and Verma (2002) studied the correlation between company quality strategy and internal quality-image, through the example of a Hong-Kong bank giant. They defined service quality on the basis of employee perception in line with the SERVQUAL dimensions; and organizational performance in line with the following two dimensions:

- financial/monetary gain – e.g. profit, growing market share, cost reduction etc.
- non-financial value gain – e.g. improvement of product/service, social positive effect, etc.

In their model the quality, perceived by employees, has a clearly positive connection with the two dimensions of organizational performance they applied (Figure no. 15). It is interesting that from the SERVQUAL dimensions only "tangibles" and "responsiveness" are connected to non-monetary value gain; while on the monetary gain all factors have impacts, except for the „assurance" dimension.

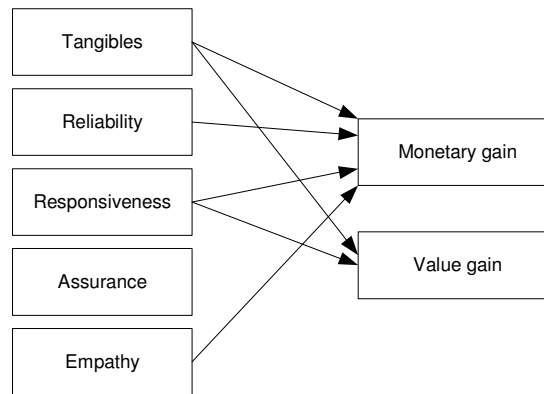


Figure No.15: Correlation between perceived service quality and organizational performance (Source: Cook and Verma, 2002., p. 52.)

The authors found that quality-awareness greatly contributes to strengthening the market position, because employees are familiar with the current situation of the company and the managers continuously inform them relevant to the available development potentials.

The survey of the Hungarian Quality Association of 2003 (Róth et al., 2006, Chapter 2.10.) indicated that in case of two-third of the companies operating ISO 9001:2000 quality management systems, the quality systems contributed to increasing efficiency and thus to a performance increase. Becser (1999) has gained similar results: almost three-quarter of the organizations, working in the different sectors, perceived that applying a quality management system leads to maintaining or increasing the company's market share. According to the latest survey conducted by involving 2600 organizations using standardized quality management systems; applying the ISO 9001 system has a positive impact on performance, namely on the "return on investment". Approx. 84 % of the respondents held that internal and external performance both were improved since the system has been applied (ANSI-ASQ, 2007).

Saizarbitoria et al. (2006) in their research on European companies, also verified that introducing quality management systems had a positive impact on performance, particularly by improving efficiency and reducing the costs of internal operations.

3.3.3. THE CONNECTION OF ORGANIZATIONAL PERFORMANCE AND SERVICE QUALITY – THE RESULTS OF DOMESTIC EMPIRICAL RESEARCHES

Addressing the issue of service quality and organizational performance relation is crucial in developing a decision support model aiming at quality improvement. Several international research ventures have proved that higher service quality results in better organizational performance (e.g. Buzzel and Gale, 1987; Fornell, 1992; Ittner and Larcker, 1998; Golhar and Deshpande, 1999; Cronin et al., 2000; Dabholkar et al., 2000; Cook and Verma, 2002; Samat, Saad, Ramayah, 2005; Olorunniwo et al., 2006). At the same time, only a small number of Hungarian researches address the connection between service quality and organizational performance. International results presumably apply in Hungary as well, because views on quality (which is primarily characterized by the number of certifications issued under the ISO 9001:2000 standard system of quality management) and economic environment are comparable to the average European development. To prove this presumption, I conducted a research in 2007 and set my hypothesis on the connection of service quality and organizational performance as follows:

H_{qual-perf}: higher service quality results in better organizational performance. In other words there is a positive correlation between the two dimensions.

3.3.3.1. DATA COLLECTION

I have tested this connection on a sample, containing a fairly small number of items, in comparison to the number of the Hungarian businesses operating in the service sector. In 2004 approximately one million business associations were operating in the service sector, approximately 37% of which had multiple members. (KSH, 2007). I must stress, that I reduced the scope of the study to small and medium companies, possessing ISO 9001 certification (servicing micro-organizations) (Parányi, 2005a). For the managers of these companies, quality and performance related concepts are not unfamiliar and they must have some data, indicators or trend numbers which contribute to determining organizational performance. I considered it important, that the participating managers could fill-out the forms independently, and that I did not have to explain the questions on quality or performance indicators. At the same time, I wanted to contact those companies that I targeted for developing the decision support system, that is small and medium service providers.

In light of the above facts, the item number of the sample is not so low, in comparison to the total number of the small and medium service companies with

ISO 9001 certifications. In 2005 in Hungary there were 15.464 organizations certified by the ISO 9001, of which –accepting the 2006 average results of the ISO Survey- almost 33% operated in the service sector: in Hungary it means almost 5000 companies. I took the data of the companies involved in the research from the database of Alfa-con Tanácsadó Iroda, Oktatóközpont Kft., Magyar Minőség Társaság`s DataCert database, and the database of the certifying organizations (DNV Magyarország Kft., Certop Kft.). Among the 250 service companies every line of the service sector was represented: retail and wholesale trade, banking and financial services. Pursuant to Parányi`s (2005) typology the great majority of the sampled companies (95%) are from the micro-level suppliers.

I used the questionnaire, attached as appendix 1., which I sent to the top managers of the 250 companies –mostly to the quality managers – by fax, email or mail. 117 of the sent-out questionnaires were returned, which means a 46,8 % response rate. The revenue distribution of the responding companies is represented by Figure no. 16.

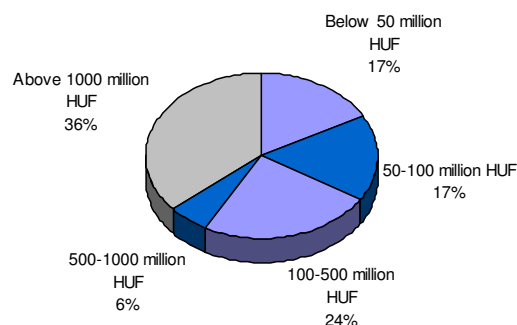


Figure No.16: Breakdown of responding companies by revenue

It is interesting to note, that although all companies have been using a quality management system (ISO 9001:2000) at least for three years, only every third applied some sort of computerized company management or decision support system.

3.3.3.2. SERVICE QUALITY INTERPRETATION IN THE RESEARCH

In have asked the respondents to evaluate the quality of their own organizations, by setting forth their answers to the statements. I have measured service quality by applying the Grönroos (1984) model, based on the performance perception scale

(functional and technical quality). The applied scale contained Grönroos's original statements as amended by Lassar et al. (2000). From the 12 statements, the first seven were connected to *functional quality* and five to *technical quality*. The scale is general enough to be interpretable for all service fields; it has been successfully applied by several researchers (Lassar et al. 2000; Samat et al., 2005) too. The service quality scale consisted of the following statements:

- 1) The courtesy and friendliness of the employees
- 2) The expertise and competency of the employees
- 3) The overall knowledge of the employees in connection with the service procedures and business policy
- 4) The reliability and helpfulness of the employees
- 5) Availability of employees for customers
- 6) The responsiveness of employees to customer requests
- 7) Efficiency of complaint handling
- 8) Fast account information (invoice administration speed)
- 9) Confidential treatment of client data, information and transactions
- 10) Process of handling customer complaints, standardization
- 11) Client contact management
- 12) Considering customer complaints in improving service quality.

I have used a five-point Likert-scale as a measurement scale, where 1 indicated low and 5 the very high value. I have determined service quality by aggregating the judgments on the 12 statements, accepting the validity of the "perception paradigm", as supported and applied by several other researchers (e.g Cronin and Taylor, 1992, 1994; Teas 1993, 1994; Liljander and Strandvik, 1994; Dabholkar et al., 2000; Lassar et al., 2000; Samat et al., 2005). Consequently the perceived service quality is determined as:

$$SQ = \sum_{i=1}^{12} P_i$$

whereas,

SQ = service quality value

i = number of statements

P_i = perceived value in connection with the i -th statement.

3.3.3.3. INTERPRETING ORGANIZATIONAL PERFORMANCE IN RESEARCH

Similarly to several other researches (such as Schmidt, 1992; Rust et al., 1995; Ranaweera, Neely, 2003; Samat et al., 2005), I interpreted organizational performance on the basis of indicators. The respondents had to determine organizational performance according to the changes of seven indicators, which took place in the last three years. I have used a five-point scale, where 1 indicated reduced/poor performance, 5 improved/enhanced performance. The applied performance indicators –using Samat et al.’s (2005) research- were:

- 1) Number of complaints
- 2) Return on investment
- 3) Financial performance
- 4) Sales growth
- 5) Productivity
- 6) Customer satisfaction
- 7) Employee satisfaction

I have aggregated the tendency judgments – similarly to service quality indicators – and I interpreted the value assigned to the change of the performance of a certain organization as follows:

$$OP = \sum_{i=1}^7 TP_i$$

whereas,

OP = value of change in the organizational performance

TP_i = perceived value connected the change of the i-th performance indicator.

3.3.3.4. RESEARCH METHODOLOGY

I have tested the reliability of the two applied scales –service quality and organizational performance – by using Cronbach-alpha, which is used to measure the degree of the internal consistency of the statements of the scale and the measured concept. If the indicator is „0,6 or less, it indicates that reliability based on internal consistency is not satisfactory” (Malhotra, 2005, p. 348.), *thus a precondition of applying the scale is that the indicator reaches a value above 0,6”.*

If the Cronbach-alpha shows a value above 0,8 the scale's reliability is "strongly" adequate, while above a value of 0,6 the reliability is adequate (Nunally, 1978).

Since this research aimed at exploring the connection of service quality and organizational performance, and not developing scales applicable to those, I did not conduct validity tests in that respect. In the survey I accepted the statements of researchers using this scale: *"the results ... appear to demonstrate satisfactory levels of reliability and validity"* (Lassar et al., 2000, p. 253.).

I have checked the connection of service quality and organizational performance, that is the validity of my hypothesis $H_{\text{qual_perf}}$ by using regression-calculations. I have applied the change of organizational performance as a dependent coefficient, and service quality as an independent coefficient in the linear regression analysis. The conditions on residuum and that on the normal distribution of the standardized residuum (Figure no. 17) were satisfied in connection with the regression calculation. This latter was proved by the one-sample Kolmogorov-Smirnov (K-S) test¹⁰ too ($p=0.272$).

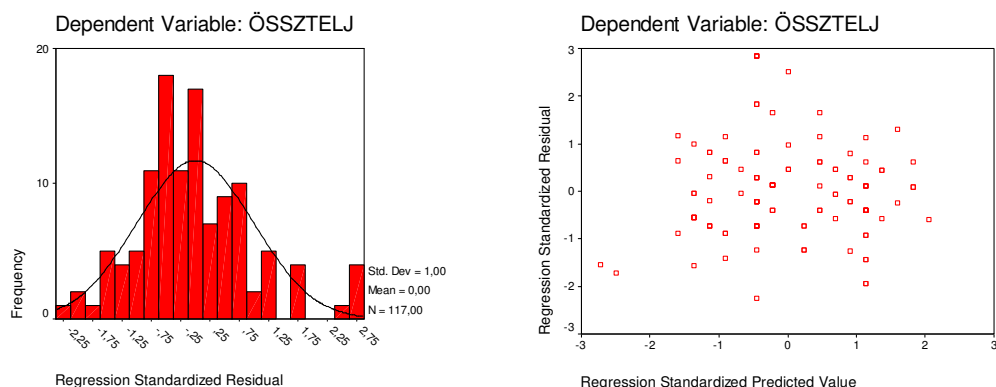


Figure No.17: Histogram of regression standardized residuals and the scatterplot of regression standardized residual, regression standardized predicted value

3.3.3.5. THE RESULTS OF THE EMPIRICAL TESTS

The reliability of the service quality scale, based on the Cronbach-alfa value "strongly adequate" ($\alpha = 0.8133$). The internal consistency of the functional quality (1-7 statements) and the technical quality (8-12 statements) dimensions -although it

¹⁰ „The Kolmogorov-Smirnov (K-S) test zero hypothesis (H_0) is that distribution does not significantly differ from normal distribution, that is we will have a normal diagram. The alternative hypotheisis (H_1) is the distribution significantly differ from the normal.” (Sajtos, Mitev, 2007, p. 226.). If the significance level of the K-S (p) is higher than the accepted significance level ($p=0,05$), then H_1 is refuted, the distribution is normal.

was above the satisfactory level ($\alpha_{functional} = 0.71$; $\alpha_{technical} = 0.62$) – fell behind the value determined in the study of Lassar et al. ($\alpha_{functional} = 0.96$; $\alpha_{technical} = 0.86$). The validity of the scale measuring the change of the organizational performance is adequate ($\alpha = 0.7037$). The lower alpha value may be caused by the fact that the applied seven indicators, although all measure organizational performance, they focus on different aspects thereof. Based on the results, we can conclude for both scales, that the statements, in fact measure the given indicator, thus the perceived service quality of the given organization and perceived change of the organizational performance may be interpreted by aggregating the values assigned to the statements.

In the course of the regression-analysis, I have examined the effect of service quality on the change of the organizational performance. The linear correlation of the two coefficients is presented by Table no. 8.

| r | R² | Adjusted R² | Std. Error of the Estimate |
|----------|----------------------|-------------------------------|-----------------------------------|
| 0,606 | 0,367 | 0,362 | 1,9570 |

Table No. 8.: Linear regression model

The results have proved that there is a positive correlation between service quality and organizational performance, which is determined by the correlation coefficient ($r = 0.606$). The determination coefficient (R^2) showed a moderately strong connection; service quality plays a 36.7% role in changing organizational performance trends.

Table no. 9 indicates the value of the standardized and unstandardized coefficients and the significance levels gained with t-tests. We could ascertain from the table, that the connection between service quality and organizational performance is significant, as showed by the significance level of t-test ($Sig. < 0.01$). The strength of the connection in case of a two-variant linear regression is determined by the value of the correlation coefficient, equaling the value of the determining coefficient ($\beta=0.606$, $p<0.05$).

| | Unstandardized coefficients | | Standardized coefficients | t | Sig. |
|-----------------|------------------------------------|-------------------|----------------------------------|----------|-------------|
| | B | Std. Error | B | | |
| Constant | 13,182 | 2,078 | | 6,343 | 0,000 |
| ÖSSZMIN | 0,338 | 0,041 | 0,606 | 8,168 | 0,000 |

Table No. 9.: Values of regression coefficients

The results support the validity of the first hypothesis $H_{\text{qual-perf}}$. On the basis of surveying Hungarian suppliers, using standardized quality management systems, we can conclude that there is a positive correlation between organizational performance and service quality: *higher service quality results in better organizational performance.*

3.3.3.6. SUMMARY – THE CONCLUSIONS AND LIMITATIONS OF THE EMPIRICAL RESEARCH

The study verified my hypothesis, that higher service quality has a positive impact on organizational performance as found by other international researches (e.g. Kroll et al., 1999; Dabholkar et al., 2000; Cook and Verma, 2002; Samat et al., 2005; Olorunniwo et al., 2006.).

I have selected the participants by directed sampling. I have interviewed service organizations which conduct quality-conscious activities, that is operate a standardized quality management system for at least three years (ISO 9001:2000). The number of respondents (n=117) is „only” two percent of the approximate number of the service organizations having certificate (app. 5000). This rate is not high, but other international researchers used samples of similar element number (e.g. Lassar et al. (2000) 80 items, Samat et al. (2005) 101 items) as well. The sample applied in the analysis is not representative of the Hungarian providers because it was a selection criterion, that the organization must have quality management systems.

It could be the objective of further researches to prove the results of this study by using a sample with more items from the Hungarian service organizations, thus being truly representative.

Service quality and organizational performance – as I presented in the above chapters – may be evaluated by many methods and along different dimensions. The scale I used in this study has been applied by numerous international surveys and its validity and applicability was proved (Lassar et al., 2000; Samat et al., 2005). At the same time the general applicability of these models cannot be proved. I presume that further researches, by assigning different meaning to service quality and organizational performance and by using different measurement methods, may find different correlation between the two variants, in terms or degree or direction as well.

Together with these restrictions – and considering the similar results of many international researches- (e.g. Buzzel and Gale, 1987; Fornell, 1992; Ittner and Larcker, 1998; Golhar and Deshpande, 1999; Cronin et al., 2000; Dabholkar et al., 2000; Cook and Verma, 2002; Samat, Saad, Ramayah, 2005; Olorunniwo et al., 2006) – I have found that: *quality-conscious business management and quality improvement (here service quality improvement) play important roles in increasing the efficiency of the organization's performance. Consequently, business organizations have a practical economic interest in developing a decision support model aimed at improving service quality.*

4. SERVICE QUALITY MODELS

In the last chapter, I have shown the economic of significance of increasing service quality and a decision support system aimed at improving retail service quality. In this chapter I will attempt to find the service quality model suitable to serve as the central factor of the service quality model.

The task is made complicated by the fact that, as I described above, the concept and the characteristics of service quality are not clearly defined. There is no exact definition, thus, there is no generally accepted measurement method that we can work with.

The meaning of service quality will depend on:

- *characteristics used to described service quality (dimensions),*
- *how the expectations are interpreted within the service quality,*
- *whether expectation play any role in service quality.*

Along the above line of questioning and by clashing arguments and counterarguments, researchers have set up several service quality models, which may be useful in construing the definition of service quality. In this chapter I would like to introduce these models, by pointing out their most important features. Further, I would like to describe the connection points of the different models and the recent attempts made to synthesize those.

Finally, I present a detailed study of the most influential model of the service quality research, the SERVQUAL, developed by Parasuraman et al. (1985, 1988) SERVQUAL, as the most significant and most often used model is much debated and challenged. In line with the studies of Smith (1995), Ausboteng (1996), Buttle (1996) and Coulthard (2004) I enumerate the arguments for and against the SERVQUAL model and take a look at the subject from all directions. According to my preliminary presumption, the SERVQUAL model (scale, dimensions) – by transforming the measuring methodology – may be suitable to serve as the central element of the decision support system aimed at improving retail service quality.

4.1. THE MOST SIGNIFICANT SERVICE QUALITY MODELS

4.1.1. THE CHARACTERISTICS OF THE SERVICE QUALITY MODELS

Parallel to changing the definition of quality and service quality, the measurement models elaborated by researchers have changed as well. This transformation is traceable in *time*, *place* and in terms of *research areas* as well. We can look at the models of the 80's the 90's as well as the models of the millennium, or that of the Nordic or the American schools. In addition, the models can be distinguished on the basis of further characteristics.

- *Framework of definition*: defining the concept of service quality;
- *Dimensions*: the dimensions determining service quality emphasized by the model;
- *Field of applicability*: which service field the model can be applied to;
- *Measurement methodology*: whether the model uses the disconfirmation paradigm or the performance paradigm as the method of measurement;
- *Service improvement*: how can the model assist in making decisions aimed at improving service quality.

The above characteristics offer an opportunity to carry out a comprehensive analysis of the individual models.

4.1.2. A SHORT INTRODUCTION OF THE MOST SIGNIFICANT MODELS

Below I would like to introduce the 17 service quality models which I found to be the most significant for the purposes of my thesis¹¹. In case of each model a short introduction is followed by the major conclusions and findings of the given model. Appendix no. 2 discusses the service quality models in a summary fashion, indicating the fundamental characteristics of the model, the methodology and some practical examples.

SQ 1. *Technical and functional quality model* (Grönroos, 1984).

This model is the starting point of the so-called Nordic school. The model is based on the premise that, in order to achieve customer satisfaction, the quality expected and actually perceived by the customers should be identical. The supplier can only succeed on the market if he/she knows how quality is perceived by the customers as

¹¹ Further service quality descriptions are available in the study of N. Seth, S.G. Deshmukh, P. Vrat (2005).

well as characteristics that influence the service quality. According to Bopp (1990), the technical level of the services is most often hidden from the customers, thus he/she has very few information in this respect. Donabedian (1982) maintained that in perceiving service quality, customers primarily focus on the functional factor.

Grönroos defines service quality as „the outcome of an evaluation process, where the customers compare their expectations with the service they have received” (Grönroos, 1984, p.37). In his model he differentiated between the three components of service quality (Figure no. 18):

- *technical quality*: determines *what* the buyer receives as the result of buying the actual service (result dimension).
- *functional quality*: determines *how* the service is provided, according to subjective perception of the customer and the customer evaluates the service procedure (process dimension).
- *image*: shows how the characteristics, originated by and connected to the technical and functional service quality, such as traditions, policies, social connections, service standards, and goodwill are mingled.

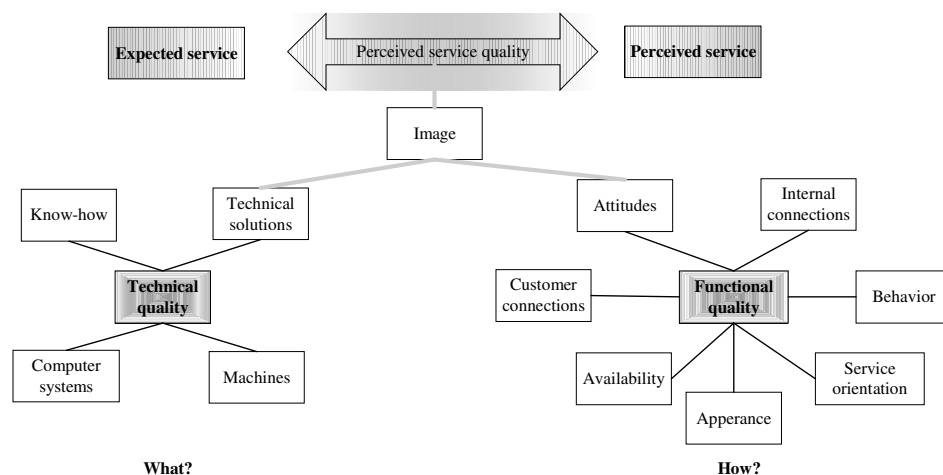


Figure No.18: Technical and functional quality
(Source: Veres, 2005, p. 69.; Grönroos, 1982, p. 79.)

Customers mostly evaluate service quality based on the dimensions of the result and the procedure; however image, functioning as a screen, influences the quality perception in a positive or a negative manner depending on how the buyer judges the supplier and its image.

SQ 2. Three-dimension model (U. Lehtinen, J.R. Lehtinen, 1991)

In the authors' interpretation, service quality may be determined on the basis of three qualities: *physical quality*, *interactive quality* and *corporate quality*. Physical quality means the quality of the supplier's circumstances, tools, equipments; interactive quality means the nature of the buyer's and the supplier's relationship; corporate quality means the image of the corporation as perceived by the buyer.

The dimensions may be compared with the technical and functional dimensions, that is result and procedural dimensions, of the Grönroos model. The researchers took the opinion that the physical quality has a result- and the procedure-nature as well; interactive quality may clearly be connected to the procedure dimension, while corporate quality is judged by the buyer even before service delivery.

SQ 3. Three-component model (Rust and Oliver, 1994)

Similarly to the model of Lehtinen et al., the model of Rust and Oliver model (Figure no. 19.) originates from the Nordic model of Grönroos, but they assigned to the two original dimensions – technical dimension (in this model: *service - product*) and functional quality (in this model: *service delivery*) – the dimension of *service environment*.

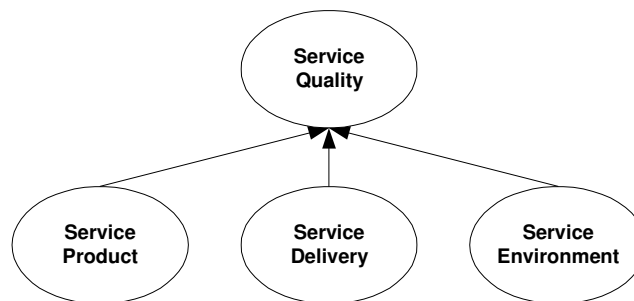


Figure No.19: Three component model (Source: Rust and Oliver, 1994)

The model was later tested by J.C.B. Llusar and C.C. Zornoza (2002) and they proved that the model is adequate. They named it the Perceived Business Quality – PBC.

SQ 4. Gap-model (SERVQUAL) (Parasuraman et al., 1985)

Parasuraman et al. maintained – in line with Grönroos – that service quality is: „*a form of attitude, related but not equivalent to satisfaction, that results from*

comparison of expectations with perceptions of performance” (Parasuraman et al., 1988, p. 15.).

Pursuant to the GAP-model, the organization and the customer may differ as to how they perceive service performance, and this is caused by the „gaps” in providing the service.

GAP 1: The customer`s expectations are not known: the buyer`s expectations and the ideas, the management has regarding that differ.

GAP 2: Wrong service quality standards: the difference between management`s ideas, regarding customer expectations and the customers` expectation as to its manifestation in the specifications.

GAP 3: Service performance gap: the difference between the specifications regarding service quality and the actual implementation of the service.

GAP 4: When promises do not match delivery: the difference between the qualities of the service and the qualities of the service as communicated to customers.

GAP 5: When the customer does not receive the expected service: the difference of the quality that the customer expects and the actually perceived service quality.

Figure no. 20 by, combining the customer`s and the supplier`s side, shows how the individual components of the model are related and connected to one another. GAP 5 is the central component of the model, because it may be minimized by reducing the other four gaps. *„the conceptual model conveys a clear message to managers wishing to improve quality of service: the key to closing Gap 5 is to close Gaps 1 through 4 and keep them closed”* (Zeithaml, Parasuraman, Berry, 1990, pp. 45-46.).

How customers experience service deficiencies, will depend on the size of the gaps. To explore the existence and the degree of the 5 gaps the SERVQUAL model is applied most often.

The SERVQUAL model has substantial theoretical and practical importance. It is also very important for the objective of thesis, to develop the decision support system aimed at improving retail service quality, thus later I present and analyze it in great details.

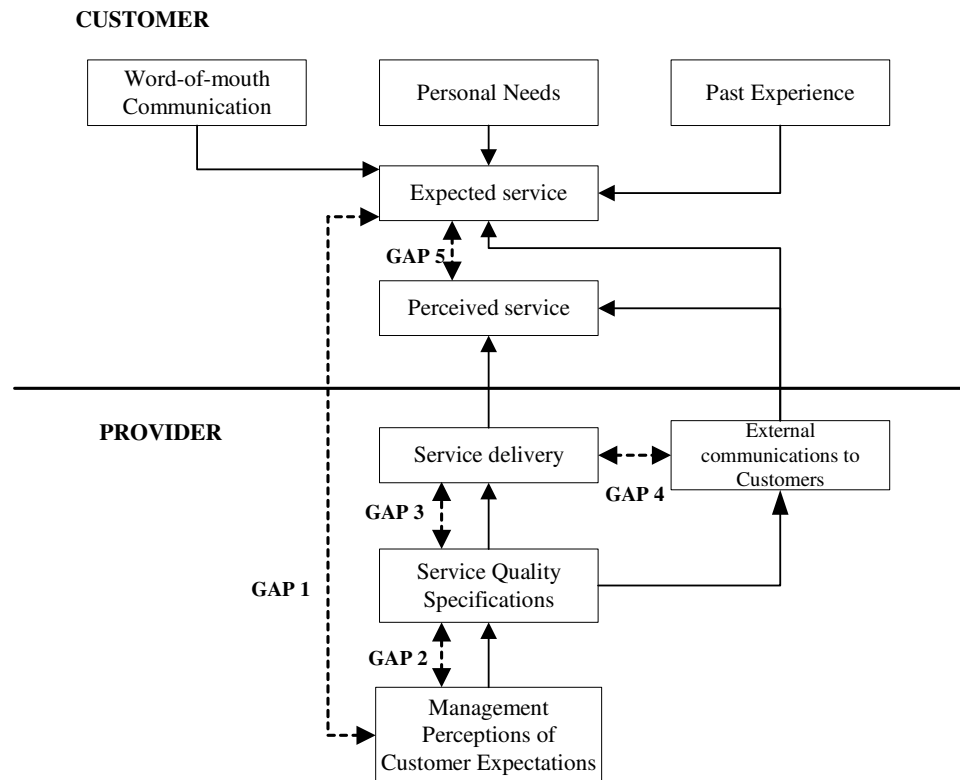


Figure No.20: Gap-model (Source: Zeithaml, Parasuraman, Berry, 1990, p. 46.)

SQ 5. Zone of tolerance model (Parasuraman et al., 1993, 1994)

The model is based on the premises of the SERVQUAL model, at the same time, it contains its criticism as well. Its most significant difference from the original model is, that it reconsiders the concept of expectation. The model presumes that consumer expectations manifest themselves at two different levels: desired and adequate service level. The zone of tolerance is between the two levels, where the customer perceives the service as acceptable (Figure no. 21).



Figure No.21: Perceived service level

The model, instead of the original two scales (expectation – performance) applies three scales (desired service, adequate service, performance). ZOT offers a more extensive and complete picture on service quality than SERVQUAL. It promulgates data potentially facilitating further analysis, by introducing the “Measure of Service

Superiority – MSS”, which is the difference between the perceived and the desired service; and the concept of “Measure of Service Adequacy – MSA”, which is the difference between the perceived and the adequate service level.

SQ 6. Attribute service quality model (Haywood-Farmer, 1988)

The model premises that the supplier provides high quality service, if it is capable to continuously satisfy customer expectations and always is familiar with the customers` preferences. The characteristics of the service are divided into three major groups: *physical facilities and processes*; *behavioral aspects*; *professional judgment*. The three groups of characteristics are located on the three tops of a triangle (Figure no. 22).

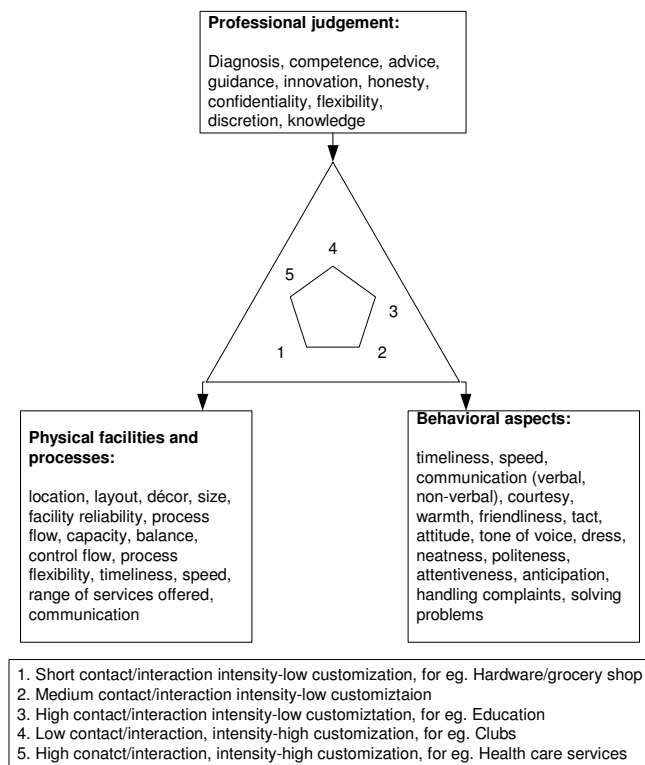


Figure No.22: Attribute service quality model
(Source: Haywood-Farmer, 1988; Seth et al., 2005)

The authors argue, that in order to achieve high quality services, an optimal balance of the different factors should be reached. If the resources are concentrated on a single area, it would cause quality standards to drop.

SQ 7. The synthesised model of service quality (Brogowitz et al., 1990)

The authors have included the traditional management methods into their service quality model, which is built on the difference between expectation and perception. The model approaches service quality from a comprehensive aspect (Figure no. 23). It takes into consideration – beside the already existing buyers – the quality perception of the prospective customers as well. Customers, who in some way (e.g. did not receive the service yet, but already received an offer on that) know, and thus are able to judge the service quality. The purpose of the model is to encompass the traditional planning-implementation-evaluation/feedback structure in measuring service quality. Utilizing the Gap-model, the authors identified several gaps connected to service quality, such as information, feedback, planning, implementation, communication, as well as the problems related to customer expectations and perceptions.

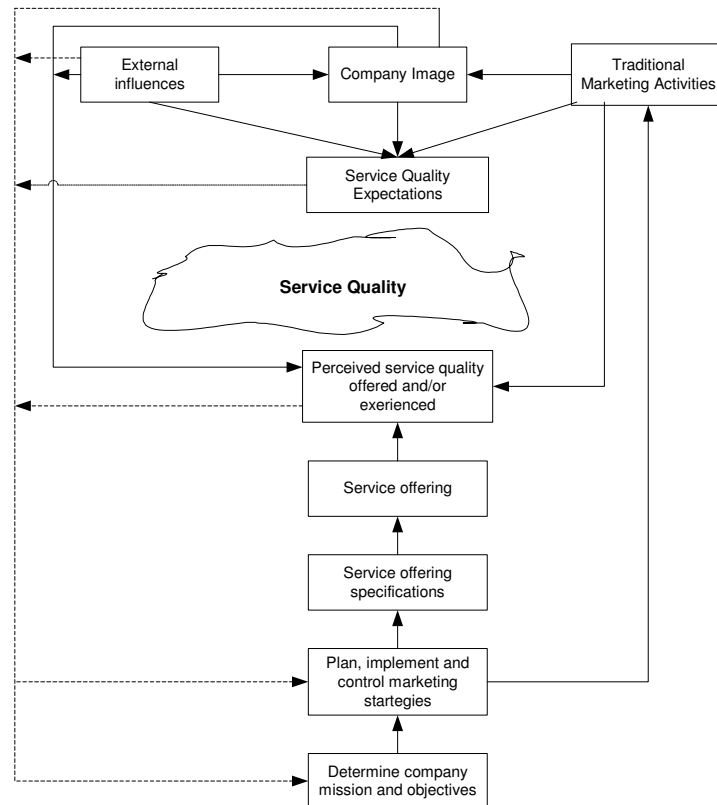


Figure No.23: Synthesised model of service quality
(Source: Brogowitz et al., 1990; Seth et al., 2005)

The model also extends the concept of expectations. The authors argued that *company image*, *external influences*, and the factor of the *traditional marketing activities* likewise influence the technical and functional quality expectations of the customers.

SQ 8. SERVPERF model (Cronin and Taylor, 1992)

Cronin and Taylor started out by presuming that the conceptual premises of the SERVQUAL model and the methodology of measuring service quality developed from it, are inadequate. They argued that the service quality measurement method, originated from the gap model (perceived performance – minus expectation formula) is not supported by theoretical or empirical research. They pointed out the marketing literature rather supports its measurements made relative to performance.

To support their hypothesis they compared their *SERVPERF model, based on the perception paradigm* with (3) three alternative models on the different service areas (banking, cleaning service, fast-food restaurant, pest control):

- (1) The original disconfirmation based SERVQUAL: $SQ = P - E$ (performance– expectations)
- (2) Weighted SERVQUAL: $SQ = w \times (P - E)$ (importance \times (performance– expectations))
- (3) SERVPERF: $SQ = P$ (performance)
- (4) Weighted SERVPERF: $SQ = w \times P$ (importance \times performance)

They have completed reliance and validity tests by applying the 22 statements of the SERVQUAL scale and the seven point Likert-scale. They have examined reliability by the Cronbach alpha numbers. The SERVQUAL model's (1) indicator was between 0,849 and 0,901, and SERVPERF's indicator (3) between 0,884 and 0,964. They have measured the standard deviation, explained by the models, by the adjusted determination coefficient (adjusted R^2). The explicative potential of the SERVPERF always exceeded that of the alternative models and the unweighted models showed a higher R^2 value in all cases than the weighted counterparts (Cronin and Taylor, 1992).

They held that the SERVQUAL model confuses satisfaction and attitude. Their research results proved the hypothesis: service quality needs to be interpreted both theoretically and practically as the attitude of the customer.

Their empirical conclusions also showed that using and administering SERVPERF is simpler (the 22 questions need to asked only once) and the *SERVPERF scale exceeds the reliability and validity of the SERVQUAL*. They have also pointed out that weighing the results do not improve the model's capacity to project. They also showed that the five service quality dimensions determined by Parasuraman et al.

(1988) cannot be proved in the studied service areas; rather service quality is a unidimensional concept (Cronin and Taylor, 1992, pp. 61-65.).

Parasuraman et al. (1994a) in their response to the critical comments of Cronin and Taylor admitted that SERVPERF has better projection potentials, but maintained that SERVQUAL diagnostic adequacy is higher and that their method provides a lot more information for manager analysis. While Cronin and Taylor opined that by illustrating service quality determined by the SERVPERF method in relation to time and other indicators and by observing the trends, the managers may receive useful information in support of their decisions (Cronin and Taylor, 1994, p. 130.).

SQ 9. Evaluated performance and normed quality model (Teas, 1993)

The model, similarly to the SERVPERF model, was originated by critical remarks made relevant to the SERVQUAL model and the disconfirmation paradigm it is based on. The author identified the following problems and deficiencies of the SERVQUAL model: the ambiguity of the definitions, the theoretical justification of the role of the expectation in measuring service quality, interpreting the connection between service quality and customer satisfaction. The author, based on his researches, proposed that (instead of the performance-expectation difference identified in the SERVQUAL model, the values determined by two separate models (EP and NQ) (actual-ideal (EP), actual-excellent (NQ)) are used. The SERVQUAL model approached expectations as the excellence level of the given service field and compared the actual performance with this level. Teas in his model introduces the concept of ideal value and uses this as a point of reference. Any deviation from this point of reference in a positive or negative direction will effect how the individual perceives quality:

- pursuant to the Evaluated Performance – EP - model:

$$Q_i = -I \left[\sum_{j=1}^m w_j |A_{ij} - I_j| \right]$$

whereas:

Q_i = the quality perception of the individual per i item

w_j = j weight of the characteristics

A_{ij} = the j characteristics of the i item as perceived by the individual

I_j = the ideal value of the j characteristics

m = number of characteristics

▪ Normed quality model

While the EP model compares the perceived quality with the ideal, the NQ model compares the actually perceived value to the excellent level, that is, practically norms the quality value. Pursuant to the premise of the model, if we define the i unit as excellent level (norm), then the equation of the EP model determines the quality of the excellent (perceived) level Q_e . Accordingly, the quality of another i unit (Q_i) if compared with the quality of the excellent level (Q_e) will indicate the normal quality (NQ):

$$NQ = [Q_i - Q_e]$$

whereas:

NQ = the normed quality of unit i

Q_e = the quality of the excellent level.

Normed quality is derived from the ideal values as shown by this formula.

$$NQ = \sum_{j=1}^m w_j (A_{ij} - A_{ej})$$

whereas:

A_{ej} = the value of the j character connected to the e excellent level, as perceived by the individual.

SQ 10.PCP attribute model (Philip and Hazlett, 1997)

The model created by the authors is a hierarchical construction (see Figure no. 24.) which is composed of three attribute-groups. All the characters and dimensions describing the service can be assigned to one of the groups. The groups are overlapping and they have a hierarchical connection.

The *pivotal attributes* are connected to the essence or the result of the service, and the customer chooses the supplier based on these attributes (e.g. capable to provide the service demanded by the customers). These attributes have the greatest impact on customer satisfaction.

The so-called *core attributes* surround the pivotal attributes, and may be interpreted as a compound of the human factor, procedure and the organizational structure. The

customer attains the essence of the service via interacting with these „core attributes” (staff, procedures etc.).

The third level of the model contains the ”*peripheral attributes*”, that is ancillary characters, with which the service forms one unity.

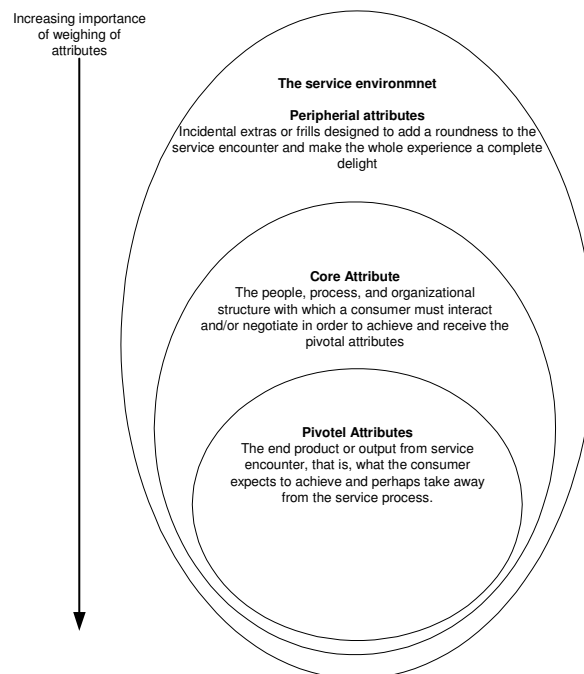


Figure No.24: PCP attribute model
 (Source: Philip and Hazlett, 1997; Seth et al., 2005)

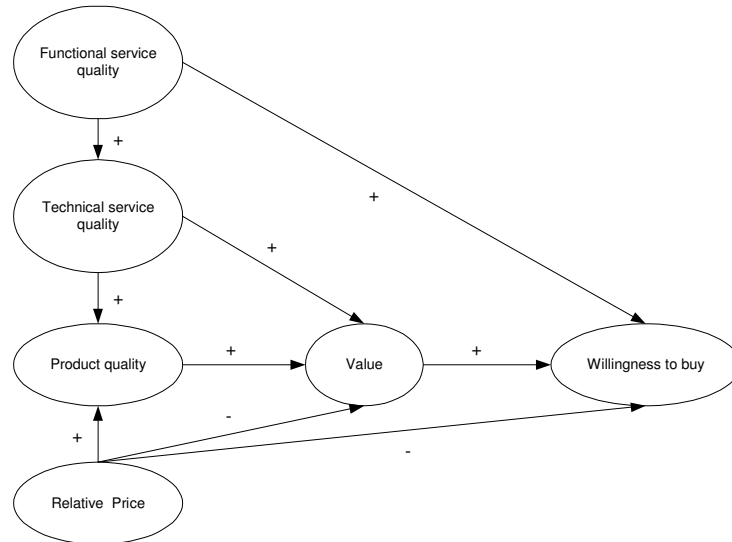
When the customer buys the service for the first time he/she will be satisfied if the pivotal attributes are properly performed, but during later interactions the core and the peripheral attributes will play a greater role in evaluating the level of satisfaction.

SQ 11. Retail service quality and perceived value model (Sweeney et al., 1997)

Sweeney et al. developed their model by studying retail services and described the impact of service quality on value and purchase propensity, as well as their correlations. In their model value means monetary value or „*value for money*” and in determining service quality, they have relied on the findings of Grönroos.

Pursuant to their model (Figure no. 25) value is impacted by the quality of the product and its price, as well as the functional and technical service quality. Their further research proved that the correlation is more complex; perceived functional service quality effects the value and the perception of service quality through the

technical service quality. At the same time the perceived functional service quality has direct effect on customers' willingness to buy, as opposed to technical service quality and product quality, which only impact customers' willingness to buy indirectly via the perceived value.



*Figure No.25: Retail service quality and perceived value model
(Source: Sweeney et al., 1997; Seth et al., 2005)*

SQ 12.CVW – Customer value workshop (L. Bennington, J. Cummane, 1998)

Bennington and Cummane (1998) developed techniques that differ from the major research directions of the service quality models. Their objective was to develop a method, integrating qualitative and quantitative techniques, thereby offering a deeper analysis of the questions of what exactly creates value for the customers. The method applies the technical version of the model of focus group and a modified version of the Gap-model developed by Parasuraman et al. (1985, 1988).

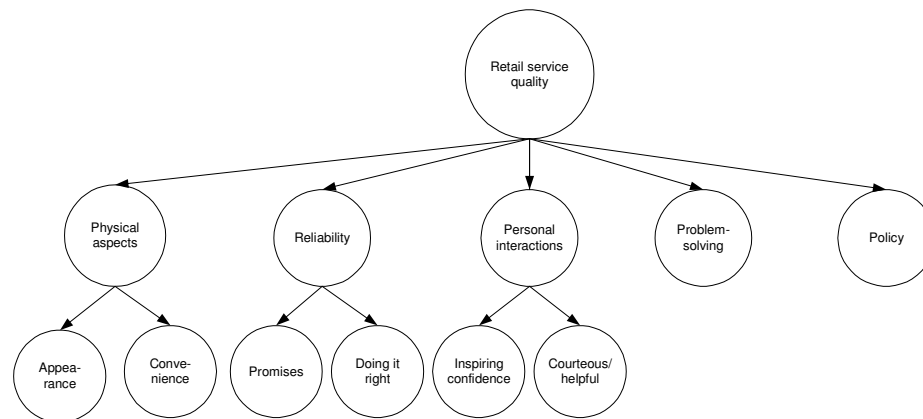
In the procedure of the CVW the participants (generally a group of 12-15 buyers) are requested to determine such mutually exclusive categories or qualifying groups, which represent the value in an ideal product or service, and then to set forth their degree of importance. In the course of the evaluation the supplier's current performance is compared to the predetermined characteristics.

The CVW method is rather time-consuming since the multi-phase, moderator introduced procedure contains the following steps: filling-out questionnaires, describing the ideal product/service, applying brainstorming techniques, preparing affinity diagrams, determining the importance of a certain value and multi-step

control and feedback procedure. Its major advantage, compared to traditional models, that it is more suitable to support management decisions, because it presents a more accurate and reliable picture of service quality and the potential directions of change and opportunity.

SQ 13. The hierarchical retail service quality model (Dabholkar et al., 1996)

The critical studies on the SERVQUAL model's factor structure made Dabholkar et al. (1996) conclude that service quality should be interpreted on multiple levels: *overall*, *dimensional* and *subdimensional* (see Figure no. 26). They have supported their presumption by studying service quality in retail trade businesses, by determining a factor structure different from the SERVQUAL model: physical aspects, reliability, personal interactions, problem solving and policy.



*Figure No.26: Hierarchical structure for Retail Service Quality
(Source: Dabholkar és szerzőtársai 1996, p.6.)*

In addition to evaluating the individual characteristics of the dimensions, customers form a general picture on the whole service, which is independent from the total value assigned to the factors. This represents the overall service quality level.

Furthermore the authors proved that individual dimensions are a lot more complex, thus they cannot be evaluated separately. Further they indicated that we can break down certain dimensions to sub-dimensions (such as the sub-dimensions of the dimension of reliability are: promise and doing-it-right). Consequently, service quality should be judged on three levels simultaneously.

SQ 14. Hierarchical model (Brady and Cronin, 2001)

The model developed by Brady and Cronin is also based on the Grönroos dimensions. Beside technical (result) quality and functional (procedure) quality, they introduced the dimension of service environment quality.

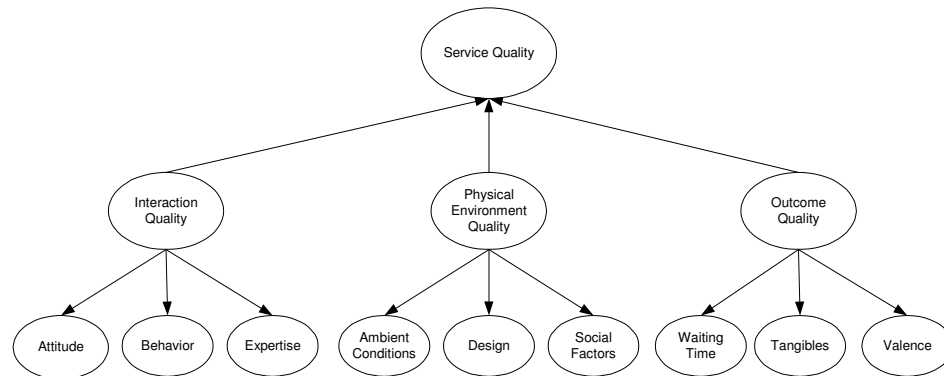


Figure No.27: Hierarchical service quality model (Source: Brady and Cronin, 2001, p. 37.)

They have construed these three dimensions as factors, which primarily determine service quality, and which all are determined by further three-three subdivisions (see Figure no. 27). Perceived service quality is the result of a multi-level evaluation, where the customers evaluate first the primary dimensions, on the basis of the sub-dimensions, and then by aggregating those, the perceived service quality of the entire organization.

SQ 15. Antecedents mediator model (Dabholkar et al., 2000)

In order to come up with a more thorough interpretation of service quality, the authors developed a theoretical model (see Figure no. 28) which includes analyzing the antecedents, consequences and mediators of service quality, as well as the results produced by the hierarchical (multi-dimensional) retail service quality model developed by the authors (Dabholkar et al., 1996).

The different quality-factors are not components of the service quality, rather their antecedents. Accordingly, customers - although they evaluate the individual dimensions as well – form a general picture on service quality which is not related to the aggregated evaluation of the factors.

They have indentified factors determining service quality or serving as antecedent to thereof (reliability, personal attention, comfort, features) or determine the relation between customer satisfaction and behavioral intentions.

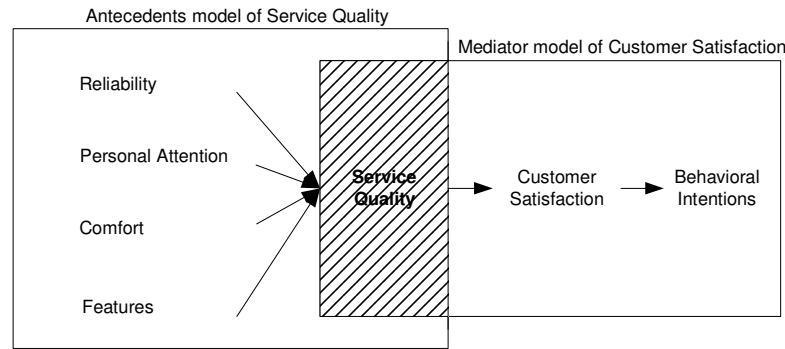


Figure No.28: Antecedents mediator model
(Source: Dabholkar et al., 2000, p. 162.; Seth et al., 2005)

SQ 16.Fundamental factors of service quality (G.S. Sureshchandar, C. Rajendran, T.J. Kamalanabhan, 2001)

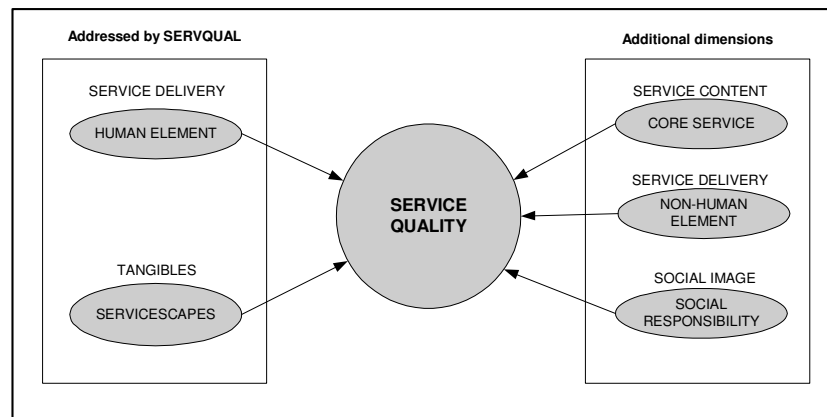
One of the latest service quality models also uses the dimensions of the SERVQUAL model. The authors, contrary to the many criticism against SERVQUAL, concluded that in the SERVQUAL list „*the 22 items are reasonably good predictors of service quality in its entirety*” (Sureshchandar et al., 2001, p. 112.). At the same time, however, these statements are organized around two major character groups: the material characteristics of the service and the subjective/personal connections of the service procedure. They argued that the SERQUAL model only concentrates on one part of the service quality. It neglects areas, such as the characteristics of the service, particularly the core service elements, *systematization/standardization of service delivery as well as the supplier`s image, goodwill, and social responsibility.*

Pursuant to their model service quality is based on five critical dimensions (see Figure no. 29):

- *core service*
- *human elements of service delivery*
- *non-human elements, standardization*
- *tangibles of service*
- *social responsibility.*

They have also developed a measurement method consisting of 41 statements by leaving out some and amending some of the SERVQUAL statements and by inserting new statements connecting to the new dimensions. They have applied the

scale preferred by Cronin and Taylor (1992), which exclusively measures the actual performance of the supplier.



*Figure No.29: Critical factors of customer perceived service quality
(Source: Sureshchandar et al., 2001, p.117.)*

SQ 17. Internal service quality, DEA model (Soteriou and Stavrinides, 2000)

The internal service quality model, based on the DEA (Data Envelopment Analysis) method is applicable, if we would like to evaluate the service quality of the units of an organization consisting of multiple decision making units (DMU) (such as bank network; corporations having multiple branch offices, franchises, etc.), or if the decision makers would like to optimally distribute the available resources among the units. The model does not propose a new service quality measurement method, but assists in applying the already available quality-related data (based on a prior service quality measurement method) in the course of making decisions on service quality improvement.

The DEA model by processing the service quality indicators of the units (input), and the performance/consuming resources indicator, determines an optimal target value, and relevant to that, evaluates the individual units. The model offers an opportunity for the units, performing under the target value to establish new directions for service quality improvement; and for the units, over performing thereof, to save resources.

SQ 18. SERVPEX model (M. A. Robledo, 2001)

Robledo's (2001) model was developed during a comparative analysis of the SERVQUAL and the SERVPERF models. The most important difference is that

SERVPEX does not evaluate the perception-expectation disconfirmation on two separate scales – as done by the SERVQUAL – but on a single one, the disconfirmation scale. By properly setting the end points of the seven point Likert scale, applied to evaluate the statements of the questionnaire composed of 26 items, expectations and perceived performance are practically evaluated parallelly. One of the endpoints is described as „a lot worse than I expected” the other as „a lot better than expected”.

In the study the 26 statements form three dimensions: tangibles, reliability and customer contacts. The study proved that the SERVPEX model as a projection scale exceeds the performance of the SERVPERF and the SERVQUAL models.

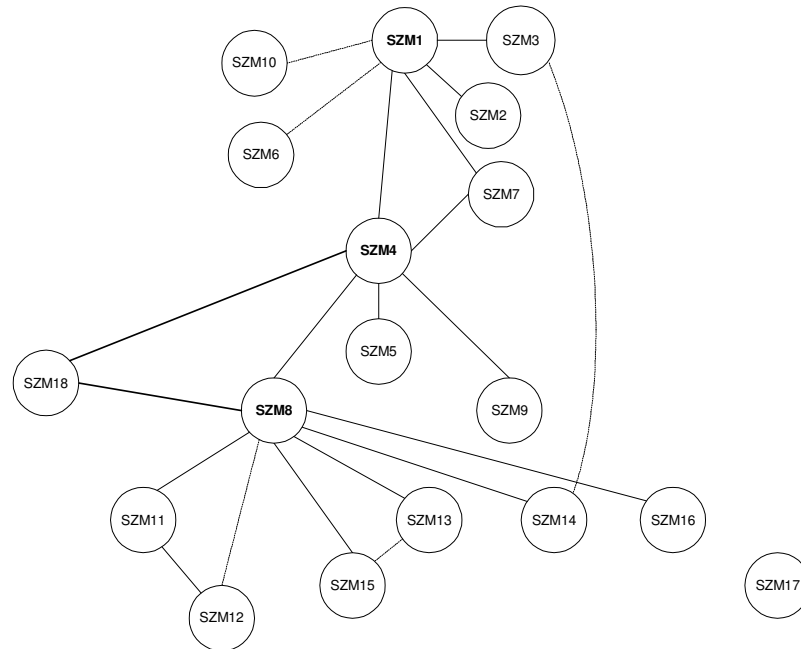
4.1.3. SUMMARY OF THE MOST IMPORTANT SERVICE QUALITY MODELS

The continuous evolution of the service quality models is well represented by the professional publications. The scientists always relied on the previous models in developing new ones; they modified the older models to a smaller or larger degree or supplemented those by new elements. Figure no. 30 presents the theoretical connections of the models.

The models based on the disconfirmation paradigm (e.g. Grönroos [SQ1], SERVQUAL [SQ4], ZOT [SQ5]), character-based methods (PCP [SQ10]; character-based service quality model [SQ6]), alternative models focusing on measuring performance (SERVPERF [SQ8], EP/NQ [SQ9]), intermediate (SERVPEX [SQ18]), model searching for the connection between satisfaction, value and purchasing attitude [SQ13; SQ15], and model applying sq as input. [SQ17].

Reviewing the professional publications proved that the late service quality models and the measurement models mostly originated from the so-called Nordic model developed by Grönroos [SQ1], and the SERVQUAL model established by Parasuraman et al. from the GAP-model [SQ4]. The comprehensive model of Borgowitz et al. (1990) [SQ7] mixes the above two models. The three dimensional model of Lehtinen and Lehtinen [SQ2], and the model of Rust and Oliver [SQ3] may be considered as a further development of the Nordic model, while the SERVQUAL model and its wider interpretation are presented by the ZOT model [SQ5].

From the aspect of the continuing development of the models the criticism triggered by SERVQUAL was of fundamental importance¹². Cronin and Taylor's SERVPERF [SQ8], Teas' (1993) EP (Evaluated performance)/NQ (Normed Quality) model [SQ9], and Robledo's SERVPEX model [SQ18] just like the attribute models (Hayword-Farmer; Philip and Hazlett).



*Figure No.30: Lineage of service quality models
(with the adaptation of N. Seth, S.G. Deshmuk, P. Vrat, 2005.)*

The subsequent studies focused on the relation between service quality and customer satisfaction, as well as that of service quality and purchasing attitude, from which newer models were developed. Cronin and Taylor's (1992) results indicated that customer satisfaction is originated by service quality, while purchasing intent is impacted by satisfaction. The antecedent and mediator model of Dabholkar et al. (2000) model [SQ15] continued to examine this connection.

Cronin and Taylor (1992) also pointed out that customers do not always buy the best-quality product, but their purchasing decision is determined by how they judge the value of the given service. Introducing concept of value in turn resulted further models [SQ11] (e.g. Sweeney et al., 1997), and hybrid techniques also appeared in this respect CVW model [SQ12].

¹² Critiques of SERVQUAL are discussed in Chapter 4.3.

The more thorough testing, on how the customer evaluates service quality, drew attention to the fact that service quality is not evaluated by customers on single level, but on multiple, parallel levels. The latest results used hierarchical, multi-level evaluations, for example the models developed by Dabholkar et al. (1996), and Brady and Cronin (2001) [*SQ13*; *SQ14*].

We can see a continuous development in identifying the dimensions constituting (or determining) service quality. Researchers always extend the concept of service quality. Beside the dimensions referring to the quality of the service results and the service procedure, new dimensions –interpreting service quality in a wider meaning – are applied, such as service environment or in one of newest model, the social role of the service provider.

By synthesizing the individual models and stressing the common elements M. Suuroja (2003) established a theoretical model, which may serve as basis of further studies in this area. The synthesized perceived service quality model is based on the following premises (to be considered for further research purposes):

- Service quality is based on performance indicators and not on the discrepancies between expectations, norms and performance. Expectations of course influence service quality but only in an indirect manner.
- Service quality cannot be interpreted by simply aggregating the results of evaluating the individual dimensions. Service quality is perceived on multiple levels (overall, dimensional, sub dimensional), where the individual dimensions are not components, but rather the antecedents of the overall evaluation of the service quality.
- Service quality characters vary depending on the service, those are not universal.

The focus of the synthesized model (see Figure 31.) is the quality of the service process, and the quality of the service result. In the hierarchical model the central elements are surrounded by the physical environment of the service. Service quality models go through constant changing and development. Besides the theoretical issues (definition of service quality, validity of performance paradigm as opposed to disconfirmation) the models vary as to the number, the structure of the characteristics of the dimensions determining service quality.

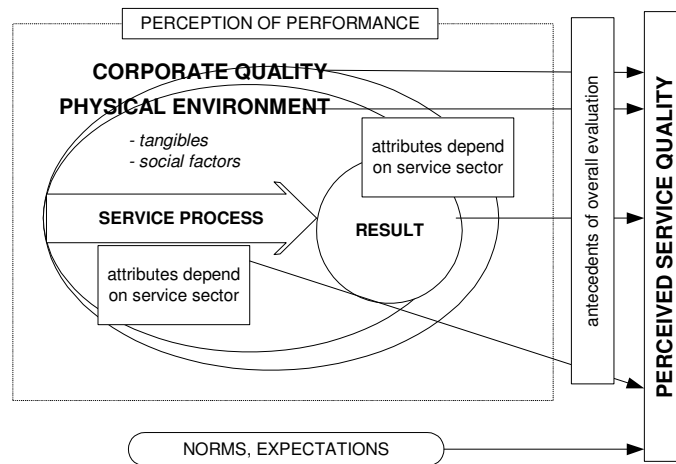


Figure No.31: Synthesised theoretical model of perceived service quality
(Source: Suuroja, 2003., p. 21.)

The publications and the models proved that dimensions change depending on the service line, thus there is very little chance to develop a general model.

With every newer model, newer ideas theoretical and practical considerations were added to the field of service quality studies. This development process does not stop, cannot stop. A generally accepted, exact base-model, the general dimensions describing the individual service sectors as well as their theoretical and practical verification are still to be accomplished.

A further challenge for researchers to adjust the already existing service quality models to the changing economic and technical environment as well to extend to areas such as internet services, business or B2B services¹³.

4.2. SERVQUAL MODEL

The SERVQUAL model, making the most profound impact on service quality and service marketing research, was first mentioned by Parasuraman et al. in their 1985 study. This was a novelty in terms of not being just one of the already existing several theories, but it was successfully applied on several service fields in the American practice. Due to its elaborated theoretical basis and the success of the practical application the model has become one of the most referenced and often

¹³ Several studies were issued on the quality of IT services and electronic services (such as Kettinger and Lee, 1994, 1995, 1997, 2005; van Dyke et al., 1997, 1999; Jiang, 2000; Carr, 2002; Parasuraman et al., 2005). Regarding the business and B2B service quality Vandaele and Gemmel (2004) published a study.

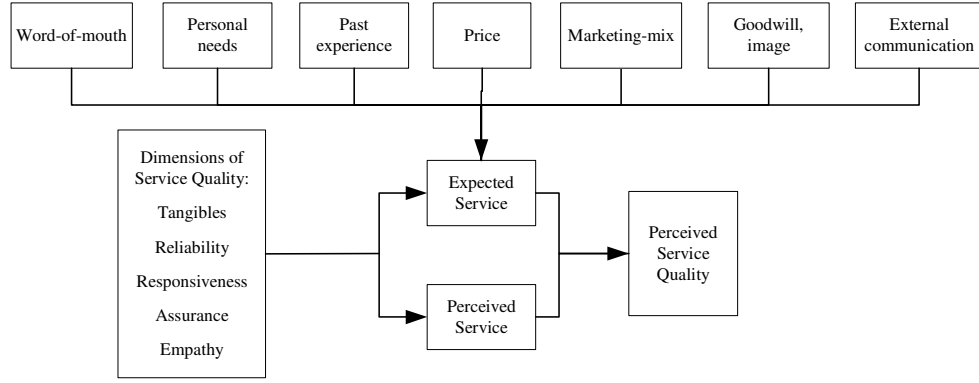
applied service model. The ABI/INFORM Global publication database in a search on the SERVQUAL key word indicted „only” 41 publications until April 1994 while un till June 2007 347 scientific papers.

The practical applications cover almost every line of the service sector. The popularity and practical application of the SERVQUAL model placed the model into the center of scientific debates, and as a result of the debates the authors modified and refined the model on multiple occasions. (Parasuraman et al., 1991, 1994).

Parasuraman et al. defined the SERVQUAL model as a tool aimed at „*assessing customer perceptions of service quality in service and retailing organizations*” (Parasuraman et al., 1988, p. 12.). The model is based on a new interpretation of quality and thus service quality. The creators of the model held that quality is much rather an attitude than an objective definition, thus perceived quality is „*the consumers’ judgment about an entity’s overall excellence or superiority*” (Zeithaml, 1988, p.3.).

In their definition service quality is resulted by the difference between expectations and the perceived performance, where the expectation is manifested as a customer demand or requirement (see Figure no. 32). Expectations are determined by multiple dimensions (Zeithaml et al., 1990):

- (1) Word-of-mouth (Informal, or formal offers);
- (2) Personal needs, different for every buyers;
- (3) Past experiences, e.g. if a customer already got used to waiting in a bank for a long time he/she will adjust his/her expectations to this custom;
- (4) Price which is often used as one specific measure of quality;
- (5) Marketing-mix element containing messages which clearly modify expectations;
- (6) Goodwill or image of the organization which has a positive impact on customer expectations;
- (7) the promises made in external communication is built into the customers’ expectations and their performance is expected of the supplier.



*Figure No.32: Customer assessment of service quality
(Source: Zeithaml et al., 1990, p.23.)*

As the result of their first research of 1985, they found that customers judge service quality based on general criteria and irrespective of the service type. As recommended by Churchill (1979), they have developed statements, having specific characteristics, which the interviewed person can accept or reject. They asked the subjects to evaluate the statements from two aspects: their expectations relevant to the statement and then the perceived performance relevant to the statement. A seven-point Likert-scale was assigned to every statements: with strongly agree (7), and I do not agree (1) end values. The questionnaire contained positive and negative statements as well, in order to prevent distortions originated by unilateral response trends or the effect of getting tired. (Kenesi, Szántó, 1998, p. 12.).

After a series of data-collections and statistical analysis, the model determines the value of the perceived service quality by evaluating the data of the 22 statements¹⁴, answered by the customers by the disconfirmation paradigm (perception-minus-expectation) along the line of five quality dimensions:

$$SQ = \frac{1}{22} \sum_{i=1}^{22} (P_i - E_i)$$

where,

SQ = perceived service quality,

P_i = the perceived performance level relevant to the i-th statement,

E_i = the expected performance level relevant to the i-th statement.

¹⁴ The original statements of SERVQUAL's expectation scale are presented in Appendix 3., the statements of perception scale are presented in Appendix 4.

Parasuraman et al. (1988) found that the SERVQUAL model may be successfully applied in several service fields; it is an comprehensive scale having acceptable statistical reliability and validity. The SERVQUAL point-value, as the difference between the perceived performance and the expectation value moves on an interval [+6 ; -6]. The more negative the difference is, the customer will find that the service quality is lower and this will mean that the managers need to address the issue of improving service quality (Zeithaml et al., 1990, pp. 24-25.).

4.2.1. DIMENSIONS

As the first step of the research in the course of the completed qualitative tests Parasuraman et al. identified ten dimensions in service quality: tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communication, understanding the customer. Later they have generated 97 statement pairs for the ten dimensions, in order to describe expectations and perceived performance.

When testing the reliability and the validity of the scale (calculation Cronbach alpha values and factor analysis), they have left out almost two-third of the original statements and combined the overlapping dimensions by the factor analysis, thus reduced the the number of statements to 22 and above service quality dimensions to five characteristics.

Beside *tangibles*, *reliability* and *responsiveness*, by increasing the validity of the scale, they identified two new factors: *assurance* and *empathy*. According to the results of their empirical tests, the intrinsic consistency of the five point scale was fairly strong and the Cronbach alpha values on all four tested fields – commercial bank, long distance telephone company, repair and maintenance services, credit card service - were spread around 0,9¹⁵.

During determining the relative importance of the dimensions, the authors have set the following order: reliability, assurance, tangibles, responsiveness and empathy.

The 22 statement of the SERVQUAL model are categorized pursuant to the following 5 dimensions:

¹⁵ Commercial bank ($\alpha = 0,87$), long distance telephone company ($\alpha = 0,88$), credit card company ($\alpha = 0,89$), repair maintenance ($\alpha = 0,90$)

- *Tangibles (1-4 statements)*: the physical appearance of the service, equipments, facilities, tools and the staff;
- *Reliability (5-9 statements)*: the ability to perform the promised service in an adequate and reliable manner;
- *Responsiveness (10-13 statements)*: capacity to solve the customer problems and serve customers quickly;
- *Assurance (14-17 statements)*: the knowledge, politeness and reliability of the employees;
- *Empathy (18-22 statements)*: care, personalized attention given by the organization to the customer.

4.2.2. REFINING AND MODIFYING THE SERVQUAL MODEL

The authors in their study published in 1991 (Parasuraman et al., 1991a) refined the model. The amendments were mostly connected to the statements applied by the model. On one hand they modified the text of the scale statements, and on the other hand they have exchanged the original statements by new ones and negative statements by positive ones¹⁶. They held that the high average values of the original model were caused by the normative wording of the statements. The amended definition focuses on what the customers expect of a supplier supplying excellent services (such as excellent companies *will* insist on error-free records), rather than on how an organization has to conduct an activity (such as companies *should* keep their records accurately). Beside the statements of the expectation scale, the statements of the perception scale were rephrased as well. Within the dimension of tangibility, they have introduced questions aimed at communication materials; in the assurance dimension aimed at the knowledge and expertise of the employees. In addition to the already existing expectation, perception scales, they have introduced a third scale into the model. They asked to respondents to divide 100 points between the dimensions, according to how important they find it relevant to a certain service. They thought that by correcting the service quality values of the individual dimensions by these relative importance values, a more accurate and reliable total service quality value may be derived.

¹⁶ I present the modified SERVQUAL scale in appendix no. 5.

Based upon the results of the tests, carried out after the amendments, the authors refined their original findings on the dimensionality of the model. They argued that the five dimensions of SERVQUAL may be clearly separated, but the factor-analysis often can not reflect the difference of the characteristics. They concluded that the „*refinement still reflects the basic five-dimensional structure of the original scale*” (Parasuraman et al., 1991a, p. 431.), but the individual factors are not clearly separated, and the correlation between them took a higher value as compared to the original researches (this is particularly true in case of responsiveness and the assurance dimensions). The tangibles factor, proved to be one-dimensional in the original scale, was divided into two-sub dimensions (one is connected to physical appearance the other to the appearance of the employees and communication material).

In 1993 the model was subjected to a further revision mostly based on the criticism directed at the expectation concept. Contrary to the former interpretations, expectations were defined as zone of tolerance, with the two end-points of the desired and adequate service levels (Parasuraman et al., 1993). In the new examination this expectation theory was included in the SERVQUAL model by using these three different models. On the questionnaire of the three-scale model, the responders were asked to form a judgment regarding the desired, the adequate and the perceived service. In the two-scale version the responders were asked to compare the perceived service with the desired and the adequate level, while the one-scale form only asked that the perceived performance is evaluated relevant to the desired service level. This time they have used a nine point Likert-scale adding the „I do not know / I do not have opinion” evaluation option. They ceased correcting by the relative value, because weighing did not improve the explanatory potential of the model.

The test results showed that all three forms have high reliability as well as their projective, differentiating and similarity validity is adequate. They found that although the one-scale method has the best projection capabilities, the most information is carried by the three-scale form. Thereby they showed that by applying SERVQUAL`s disconfirmation approach, managers will acquire more adequate and usable information for their decisions on service quality, in comparison with the other forms. Their conclusion, that the original five dimensions

of the SERVQUAL cannot be identified clearly, is of great importance. Responsiveness, assurance and empathy overlaps, thus finally three dimensions may be identified: tangibles, reliability and the common dimension of responsiveness and assurance and empathy (Parasuraman et al., 1994b, p. 221.).

4.3. CRITIQUES OF THE SERVQUAL MODEL

Parasuraman et al.'s confident declarations concerning the SERVQUAL model's general character, reliability and validity resulted in further analyses and critical remarks taking these as starting points among experts of both theory and practice, (Coulthard, 2004, p. 481.).

Based on the first criticisms (Carman, 1990) concerning, among others, necessity of negatively worded statements and reading of the concept of expectation, Parasuraman et al. (1991a, 1994a, 1994b) conducted modifications on the model and re-defined certain statements for the sake of easier intelligibility.

However, most of the repeated researches did not support the authors' statements. It must be added, however, that these repeated researches most often applied research methods somewhat modified as compared to the original model. The original statements were changed; the 22 statements were re-defined and several ones were detracted from and added to them, depending on the service sector where the research was conducted. Various technologies were introduced also in methodology. For instance, other scales were applied instead of the Likert scale of 7 points and polling by questionnaires as well as the related administration were conducted in various ways.

Parasuraman et al. (1991a) drew attention to the fact that researchers could get a proper result on the quality of services only if they apply the original model in its entirety, without any modification. For this purpose, even a guide was composed concerning the proper application of SERVQUAL. In their opinion, minor modifications on the definition of the statements do not hurt the integrity of the entire model, however, omission of certain statements or insertion of new statements would question the entirety and reliability of the model.

Criticisms concerning the SERVQUAL model can be classified as follows:

- Theoretical bases

- Process orientation
- Dimensionality
 - Number of dimensions
 - Problems of the factor structure
- Role of expectations
 - Reading of the concept of expectation
 - Two administration, order-keeping
 - Disconfirmation versus perception paradigm
 - Dynamism
- Psychometric problems due to difference rates
- Problems of Likert-scales
 - Centering
 - Number of categories
- Relation between service quality and satisfaction

The single groups of remarks enumerate both theoretical and practical arguments concerning the applicability and suitability of the model. I am summarizing the arguments and counter-arguments based on the works of Smith (1995), Ausboteng (1996), Buttle (1996) and Coulthard (2004). I also touched the relation between service quality and satisfaction in chapter 3.3.2 in relation to the organizational performance.

4.3.1. THEORETICAL BASES

Criticisms concerning the theoretical bases of SERVQUAL essentially question the validity, reliability and applicability of the model. By comparison of customers' expectations to the perceived performance of service providers, SERVQUAL interprets the perceived quality as an instrument which is related to customers' satisfaction but does not coincide with it. However, according to the arguments of Oliver (1980), Cronin, Taylor (1992, 1994) and Iacobucci (1994), the perceived quality is much rather an *attitude*. Cronin and Taylor stated that the disconfirmation-based SERVQUAL model did not measure the service quality or the customers' satisfaction, it was a model based on a „flawed paradigm” (Cronin and Taylor, 1992, p. 64.).

Andersson (1992) questions the economic, statistical and psychological bases of the SERVQUAL model's formation. Firstly, the model disregards the *costs* of service quality improvement. Secondly, the *method of data collection applied* to the chosen statistical method (factor analysis) is false as it applies an ordinal scale (Likert scale) instead of the interval scale, which is more applicable to factor analysis. Deriving from the application of ordinal scale, it can hardly handle connections and interactions between the individual dimensions. Thirdly, *psychological factors* were poorly considered during formation of the model.

4.3.2. PROCESS ORIENTATION

The nordic model (Grönroos, 1984) examined among service quality models and the further methods developed from that (Lehtinen and Lehtinen, 1991; Rust and Oliver, 1994) interpret service quality in a broader sense. They separate the dimensions concerning the service's result (technical quality, result quality) and process (functional quality, process quality), completing them by the dimension of image (Grönroos, 1984), company quality (Lehtinen and Lehtinen, 1991) or organisational environment (Rust and Oliver, 1994).

In essence, the SERVQUAL model only focuses on the process; in fact, *it examines only one segment of service quality*, the quality of the servicing process. Although several statements can lead to the reading of further quality-related aspects, the model is still process-directed. Further components displaying the general reading of service quality are missing, such as factors concerning the core service, the service as „product”, the judgement of the organisation as participant of market and society or, even the business policy of the organisation (Sureschandar et al., 2001).

Recent researches (Brady et al., 2002; Chui, 2002) miss further factors: they urge on that the model should cover the rate of the service as well as feelings and emotions related thereto.

4.3.3. DIMENSIONS

4.3.3.1. NUMBER OF DIMENSIONS

A major part of criticisms in relation to the SERVQUAL model concerns the dimensionality of the model. The repeated researches (like Babakus and Mangold,

1989; Carman, 1990; Finn and Lamb, 1991, Saleh and Ryan, 1992; Babakus and Boller, 1992; Bouman and van der Wiele, 1992; Gagliano and Hathcote, 1994; S. Llosa et al., 1998; Dabholkar et al., 2000; Cunningham and Young, 2002) most often could not reproduce the five original service quality dimensions. Based on the settings of the applied factor analysis methods, several researches could identify from six to nine dimensions (Carman, 1990), while other researches only one (Cronin and Taylor, 1992; Brown et al., 1993). The latter researchers expressly argued in their essay for the one-dimensional service quality. Llosa et al.'s (1998) research did not support this latter assumption but neither did it prove Parasuraman et al.'s (1988) results. Nearly 74 per cent of the persons polled by researchers classified the 22 original statements into 3-6 groups.

The number of dimensions varied on a broad scale *depending on the field of service* examined. According to Babakus and Boller „the domain of service quality may be factorially complex in some industries and very simple and unidimensional in others” (Babakus and Boller, 1992, p. 265.). Carman's (1990) research on hospitals identified nine dimensions: (reception of patients, accommodation, food, secrecy, nursing, introduction to treatment, courtesy, directing visitors, planning of dismissal, invoicing). Gagliano and Hathcote (1994) examined the clothing retail industry and defined four dimensions (personal attention, reliability, tangibles, comfort). Bourman and van der Wiele (1992) described three factors in car servicing, namely gentleness to the customer, tangibles and fairness.

Parasuraman et al. (1994) also faced the problem of dimensionality when examining the SERVQUAL model repeatedly. In the repeated research, they could identify only three dimensions instead of the five original ones. Above tangibles and reliability, the three other dimensions (responsiveness, assurance and empathy) fused to one common factor.

4.3.4. PROBLEMS OF THE FACTOR STRUCTURE

It is a further problem that the statements forming the original factors do not clearly fit in the factor to which we would expect them. In Carman's (1990) essay, for instance, two of the statements originally belonging to the SERVQUAL's empathy factor came into the dimension of tangibles during analysis of a dental clinic's service quality and similar anomalies were experienced during examination of other

service sectors as well. This observation was supported by further essays (Buttle, 1996).

The five factors of SERVQUAL are „composed” by 4-5-4-5-4 statements sequentially. The few composing items (statements) attached to each dimension result in the changeability of the factor structure. By application of more statements, the stability of the single dimensions can be increased, which was also accepted by Parasuraman et al. (1991). Carman (1990) applied 40 statements upon analysis of the hospital service quality, Bouman and van der Wiele (1992) did 48 in the field of car services, Dabholkar et al. (1996) did 28 in the case of retail services, while Sureshchandar et al. (2001) did 41.

The definition of the single statements i.e. the positive or negative coding can also affect the factor structure. Thirteen of the SERVQUAL's 22 statements were worded in positive, while nine in negative form. Each of the „denying” statements belonged to one factor (responsiveness and empathy). Although Parasuraman et al. aimed to decrease the possibility of systematic yes-no answering, later this practice was still rejected (Parasuraman et al., 1991a). This happened in part because this method increased the time to fill in the questionnaires: twenty-two statements had to be assessed twice and, in addition, even the negative statements had to be interpreted by the answering person. The other reason was that Babakus and Boller (1992) had proved during application of the factor analysis that the positive-negative definition results in *”method factors”* and not dimensions to be derived from the statements themselves (Buttle, 1996, p. 22.).

Analysing the researches, we can state that the foregoing researches have not found a generally applicable dimension structure describing the service quality universally and comprehensively. Dimensions may vary depending on both the examined field of service and the applied research method.

4.3.5. ROLE OF „EXPECTATIONS”

4.3.5.1. INTERPRETING THE CONCEPT OF EXPECTATION

Several researchers have questioned *the wording of the statements of the expectation scale*. It is not clear what the expectations must refer to: the level expected under ideal, excellent or the given environmental conditions. The wording of the

expectation scale upon formation of the model effected that most of the answering persons gave the mark of six or seven to the statements on the Likert-scale of seven degrees (where the two ends meant „do not agree at all” and „totally agree”). Authors were ”recognizing that the „should” terminology might be contributing to unrealistically high expectation scores”, which questioned the model’s applicability, therefore the wording of each statement were modified (Parasuraman et al., 1991a, p. 422.). For instance, they indicated the statement „excellent companies *will* insist on error-free records” instead of the statement „companies *should* keep their records accurately”. However, Brown et al. (1993) noted that this modification had little effect.

Based on his researches, Teas (1993, 1994) reached the conclusion that answering persons read expectations in different ways. In his opinion, differences between the single expectation-scores related to each statement do not derive from the different judgement of each answering person related to the given statement but much rather from the fact that everybody reads the concept of expectation in another way. He thought that answering persons applied any of the following six readings in relation to expectations (Teas, 1993):

- Service attribute importance – how important is the given statement for the answering person
- Forecasted performance – possibility of the future realisation of the performance expected by the answering person (can be)
- Ideal performance – optimal level, which *may be* the performance of the service provider
- Deserved performance – which *should be* the performance of the service provider *considering the investments* for the use of services,
- Equitable performance –which *ought to be* the performance of the service provider *at given costs*,
- Minimum tolerable performance – which minimally *must be* the performance of the service provider.

Based on his conclusions reached from analysis of reading of the concept of expectation, Teas (1993, 1994) deemed the expectation an ideal base of comparison in his models (Evaluated Performance and Normed Quality).

In relation to the role of expectations in the model, Teas (1993, 1994) raises further questions. The -1 value of the perceived service quality (P-E) measured according to the disconfirmation (concerning a given statement) can arise based on six different combinations of P (performance) and E (expectation) scores (P=1, E=2; P=2, E=3; P=3, E=4; P=4, E=5; P=5, E=6; P=6, E=7). Do the values determined by the different pairs of scores mean the same perceived service quality? Are the expectation rates universally valid for all service providers in a given sector or do different expectations belong to the different service providers? Does one standard expectation of general validity belong to each (SERVQUAL) statement and dimension or does the customer have other expectations in case of the different services depending on their location, for instance?

Accordingly, Iacobucci et al. (1994) would rather apply some general standard instead of the subjective and ambiguous concept of expectation in the model. Similarly, according to the definition of Voss, Roth, Rosenzweig, Blackmon and Chase, service quality is „based on the meeting or exceeding of certain established service standards” undertaken by the given service provider (Voss, Roth, Rosenzweig, Blackmon and Chase, 2004, p. 213.). Thus, according to their wording, expectations are not based only on the customer’s subject but on the performances undertaken by service providers, which may be influenced by the ability of service provider as well.

4.3.6. TWO ADMINISTRATION, ORDER-KEEPING

It was a further criticism that the execution of the method, *administration of the double scale is difficult*, as an answering person must assess the same 22 statement twice: first on the basis of the expectations and then based on the perceived performance. This is not only time-consuming and boring but it often leads to the so-called exhaustion effect, which questions the suitability and truth of the collected data (Bouman and van der Wiele, 1992).

It is neither the same *in what order* are the answering persons polled on the two scales: first the expectation scale and then the perception scale, eventually in reverse order or perhaps both at the same time. Caruana (2000) proved by analysis of the SERVQUAL’s developed, three-scaled model (Zone of tolerance) that the answers given first to the expectation scales (desired, adequate) influenced the perception

rates significantly. These results correspond to the psychological researches showing that answering persons are influenced by the previous answers and experiences related to the same question (Strack and Martin, 1987).

4.3.6.1. DISCONFIRMATION VERSUS PERCEPTION PARADIGM

According to the disconfirmation paradigm, customers assess the service's quality by comparison of their expectations to the perceived performance. Accordingly, the perceived service quality can be described in the following form:

$$SQ=E-P,$$

where

SQ = perceived service quality

E = expectation concerning the given characteristic of the service

P = perceived performance of the given characteristic of the service

A customer perceives the service quality as positive only in case the performance of the service provider exceeds the customer's expectations.

According to the perception paradigm, the perceived service quality is exclusively determined by the customer's perception concerning the service provider's performance. According to the paradigm, the service quality can be described by the following equation:

$$SQ=P$$

where

SQ = perceived service quality

P = perceived performance of the given characteristic of the service.

Expectations affect the perceived performance but they have no direct role in determining the service quality.

This latter idea was followed by several researchers (Carman, 1990; Bolton and Drew, 1991; Babakus and Boller, 1992; Cronin and Taylor, 1992) in their essays when they questioned the *necessity of the expectation scale* and thus the grounds of the *paradigm of disconfirmations* in the SERVQUAL model. Cronin and Taylor (1992) proved in their essay that applying only the perception scale (*perception paradigm*) surpassed the SERVQUAL model both in statistical reliability and in

scale validity. This finding was supported by several repeated researches (Boulding, Klara, 1993; McAlexander et al., 1994; Caruana, Ewing, Ramaseshan, 2000; Lee et al., 2000; Brady, Cronin, Brand, 2002, for instance).

In their response to the criticisms, Parasuraman et al. (1993, 1994a), besides acknowledging certain weaknesses of their scale, argued for application of the expectation scale because it „provides the benefits of richer, more accurate diagnostic information” (Parasuraman et al., 1993, p. 145.).

However, recent researches (Sharma and Stafford (200), for instance) read expectations as a factor influencing the service quality’s perception much rather than the component part thereof. Although the expectation minus perception rate is really more logic and it contains more meaning, it is also true that customers, when evaluating the perceived performance, always consider their expectations unconsciously, meaning that the perceived rate includes the expectations as well.

4.3.7. DYNAMISM

Customers insert their previous experiences into their expectations and they modify them flexibly, eventually influenced by technical development. It is not clear how the model captures this continuing, dynamic change of the expectations. According to several longitudinal researches, expectations may be higher and higher by progress of time (Parasuraman et al.’s works, for instance) but they also may decrease (in the medical sector, for instance). Researchers agree that researches on service quality should focus on study of dynamic models in the future (Buttle, 1996).

4.3.8. PSYCHOMETRIC PROBLEMS DUE TO DIFFERENCE RATES

Some researchers (like Brown, 1993; Spreng and Singh, 1993; Van Dyke et al., 1997) drew attention to psychometric problems concerning analysis of SERVQUAL’s difference rates. According to their arguments, the further analysis of a new variable deriving from the difference between two different index numbers (in the specific case the index concerning the perceived performance and that representing the expectations) leads to psychometric problems related to reliability and validity of differences. Thus, the question arises what the scale measures in fact. In addition, researchers also questioned usability of the generally applied Cronbach-alpha as regards to difference rates (Buttle, 1996).

4.3.9. PROBLEMS DERIVING FROM THE APPLIED LIKERT-SCALE

Although most researchers modified the number of statements of the original SERVQUAL model, their wording and the applied methods in their essays, almost all of them insisted on the application of the Likert-scale. However, two main problems have to be stressed in relation to this evaluative scale: the issues of centring and the number of categories (Smith, 1995; Buttle, 1996).

4.3.9.1. CENTRING

Answering persons who, in the lack of knowledge and experiences, can not assess some questions, indicate the centre (meaning rate 4 in the case of SERVQUAL) as the „do not know” choice is missing. Thus, final results are distorted significantly.

However, Babakus and Mangold (1992) have shown that, in the lack of the „do not know” choice, a significant number of answering persons leave one or more questions unanswered and cause problems in processing of the questionnaire this way. On the other hand, the lack of the „do not know” choice may move the answering person still to indicate something (despite the fact that he does not know the statements in question and does not have related experiences). This, however, may lead again to distorted final results and false service quality rates.

Besides that centring can be regarded as a neutral value judgement or a „do not know” answer, centring may raise a further problem. Namely, it means some satisfactory solution from the answering person’s point of view: by filling in the questionnaire quickly, he did what he was asked to do but, as a consequence of the hurry, he did not thought over the statements. Instead, rather choosing the middle course, he did not give too high or too low rates, either. Of course, neither these rates reflect the answering person’s actual attitude, thus they may lead to false conclusions in the long run (Krosnick et al., 2002).

4.3.9.2. NUMBER OF CATEGORIES

When Likert-scale „is applied, the answering person must indicate how much he agrees or disagrees with a number of statements concerning the examined unit” (Malhotra, 2005, p. 336.). The number of the scale’s categories and the wording of the specific category rates, among others, however, significantly influence answers.

The SERVQUAL scale contains seven categories, which corresponds to the traditional suggestions concerning the number of categories. Only the ends of the single categories are verbalized by definitions of „totally agrees” and „totally disagrees”. Some researchers (Smith, 1992) state that definition of only the ends may move the answering persons rather to choose the extreme rates. This shift to the positive direction was verified by several repeated researches related to the SERVQUAL model and Parasuraman et al. (1994a) acknowledged the phenomenon as well. However, defining each scale category one by one does not definitely improve the accuracy and reliability of the data (Andrews, 1984; Malhotra, 2005).

In the repeated researches related to the SERVQUAL model, most researchers (like Finn and Lamb, 1991; Babakus and Mangold, 1992, Dabholkar et al., 1996) applied a scale of five points as an alternative of the Likert scale of seven points. Other researchers (like Robledo, 2001; Brady et al., 2002) also applied a disconfirmation scale of five points, which however, was formed by re-definition of the ends of the scale („much better than expected”; „much worse ...”). Robledo (2001) tested the SERVPEX model consisting of 26 statements and of three dimensions determined by the statements (tangibles, reliability, customers’ relations), by means of analysis of the service quality of airlines, applying the disconfirmation scale of five points. In the essay, the SERVPEX model’s better validity was justified as compared to the SERVPERF (a model based on perceived performance only) and SERVQUAL models.

Notwithstanding the above, the issues of the applied scale, the number of the scale’s categories and the wording of the single categories are still open.

4.3.10. A RELATION BETWEEN SERVICE QUALITY AND SATISFACTION

According to some researchers (for instance, Parasuraman et al., 1988; Woodside et al., 1989, Cronin and Taylor, 1992), quality results in satisfaction, while other researchers (Bitner, 1990; Bolton and Drew, 1991) proved in their essays that the causal relation functioned right reversally: quality originates from satisfaction. Other analyses did not find any causal relation between the two instruments. According to Hofmeister et al., the positive quality assessment does not definitely exclude dissatisfaction: „for instance, a person finding a too expensive hotel room by fortune (i.e. that he could find a room at all) will not probably be satisfied with the result

even if he appreciates the quality of the service” (Hofmeister et al., 2003, p. 52.). Bowers et al. (1994) drew the conclusion that both the quality and the satisfaction were determined by the same factors. Iacobucci et al. (1995) precised this latter statement in their research so that the service quality and satisfaction were determined by different factors. The price, customer service, expertise can rather be related to the quality, while accuracy, physical environment and development of the service to the satisfaction.

Disputes concerning the causal relation between the two concepts basically derive from reading of the extension of satisfaction and service quality (i.e. whether it concerns a specific transaction or it is a result of an overall assessment) as well. Parasuraman et al. (1988) defined the perceived quality as the overall assessment of the service. According to their reading, quality may only relate to the full and long-term relation to the service provider, while the satisfaction only to the event of shopping/servicing in question (Parasuraman et al., 1988).

In their later works during disputes concerning the SERVQUAL model (Parasuraman et al., 1994a), they connected the opposing theories by mixing the two approaches.

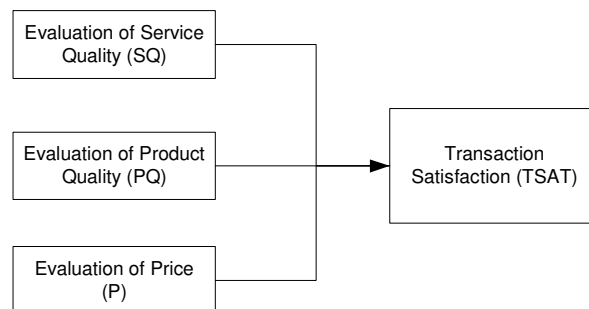


Figure No.33: Components of transaction-specific evaluations
(Source: Parasuraman et al., 1994a, p. 121.)

In case we regard satisfaction as transaction-specific, then, according to their theoretical model, this can be described as the function of service quality, product quality and the price (see Figure no. 33). This corresponds to the findings of researchers (Woodside et al., 1989) supposing the relation „service quality → customers’ satisfaction (SQ → SAT)”.

Customers, however, form a global view on the service provider by summarizing the single transactions; this means the overall reading. Of course, this impression is determined by the customer's overall satisfaction, the perceived overall service quality, product quality and price.

In this aspect, the satisfaction (related to the single transactions) determines service quality (SAT \rightarrow SQ) as proven by Bitner (1990), Bolton and Drew (1991) (see Figure no. 34).

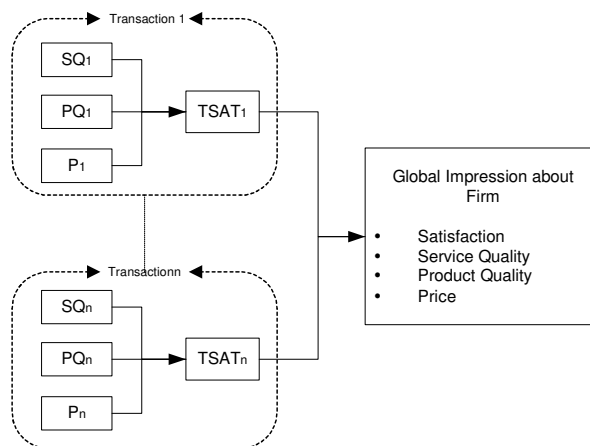


Figure No.34: Components of global evaluation
(Source: Parasuraman és szerzőtársai, 1994a, p. 122.)

Most of the recent researches on the relation between satisfaction and quality support the transaction-specific relation of service quality \rightarrow customers' satisfaction (Cronin, Brady and Hult, 2000).

In a previous work, Dabholkar et al. (1995) were of the opinion that the logical relation between satisfaction and quality depended on the situation and orientation: if the answering person is oriented by emotions (affects), the satisfaction causes positive service quality in his perception. However, in case he is a cognitive person, then he feels that the satisfaction depends on the perceived quality. In order to test this statement, Brady and Robertson (2001) conducted examinations concerning the services of American and Latin-American fast-food restaurants in various fields of culture. As experienced by them, although people in Latin-America are rather oriented by emotions and in the United States the cognitive orientation is

characteristic, there was no difference regarding trends of satisfaction and quality: the perceived quality determined satisfaction.

In their "antecedent and mediator model" formed later, Dabholkar et al. (2000) already regard customers' satisfaction as an overall value judgement concerning service quality: satisfaction derives from assessment of the service quality where the quality of the service is determined by various factors, such as reliability or reactive responsiveness.

This relation was supported by further essays. For instance, Lee et al.'s (2000) research in three fields of services, Brady et al.'s (2002) examination among services of entertainment and telephone service providers, as well as Olorunniwo et al.'s (2006) analysis concerning hotels and motels.

4.4. SUMMARY

The basic concept, i.e. research of models aiming at the comprehension and measuring of service quality is definitely needed, which is proven by thousands of essays of the last more than twenty years in this subject.

According to Parasuraman et al. (1985, 1988), the SERVQUAL model formed by them is a concise (multi-item) scale consisting of several statements, which helps decision-makers to understand customers' expectations and perceptions in a reliable and valid form and, at the same time, to develop service quality. According to Rust and Oliver, "the SERVQUAL instrument captured the crux of what service quality might mean" (Sureshchandar et al., 2001, p. 113.). It served as a basic model, which drew the researchers' attention to the measurement of service quality and, the reading of service quality and the possibility to measure it aroused the interests of practical experts as well. Each criticism provokes further considerations on the side of researchers and experts in order to really create a proper and extensively accepted service quality model in the long run.

With regard to criticisms, it can be stated that the SERVQUAL model is a good starting point but it is not the solution at all. It is obvious that no model universally interpretable in all fields of services can be formed as various quality dimensions can be read in the various sectors (this is supported by Babakus and Boller (1992),

for instance). The simple basic models (e.g. the technical and functional quality model of Grönroos) are general in theory but during practical application, they face the same difficulties of measurement as the subsequent models of more dimensions. Thus, the greatest problem can rather be found in the method of measurement. The dispute of the disconfirmation versus perception paradigm and the issues of the difficult and complicated reading of the expectation concept seem to be decided according to the results of the recent researches: major part of the essays is based on the „only perception” scale and they regard expectations as factors influencing perception (for instance, Cronin and Taylor, 1992, 1994; Dabholkar et al., 1996, 2000; Brady et al., 2002). Nevertheless, the method of polling, the dimensions forming the model and the number of statements determining them as well as the applied scale, the number of scale categories and their wording are still questionable.

In my opinion, the dimensions and scale of the SERVQUAL model can be applied in the decision support system for development of service quality in retail as a starting model following the thorough study of arguments, counter arguments and of the related service quality models. I tested this assumption in a research conducted among Hungarian retail service providers. Researches must be continued depending on the results of the examination, either by synthesis of the existing models of the retail service quality or by implementation of the foregoing results and remarks of criticism or by formation of a brand new concept.

As regards to the measurement method, I do not deem SERVQUAL's method of more than one scales suitable, considering simplicity, which is a basic requirement of the decision support system to be formed. Similarly to several researchers (Babakus and Boller, 1992; Teas, 1993, Andaleeb and Simmonds, 1998; Dabholkar et al., 1996, 2000), *I accept Cronin's and Taylor's (1992, 1994) reading regarding the SERVPERF method and I apply the perception paradigm suggested by them, exploiting its advantages, the simpler applicability, better ability of statistical explaining and validity.*

5. EMPIRICAL RESEARCHES CONCERNING ADEQUACY OF THE SERVQUAL SCALE

In my opinion, the SERVQUAL scale can play the role of the measuring scale in the decision support system for retail service quality, by implementation of the perception paradigm. The scale of 22 items and the five service quality dimensions were successfully applied in several researches; nevertheless, its validity on the field of retail services may not be accepted without reservations in the light of the criticisms introduced in the previous chapter.

In this chapter, I detail my empirical researches concerning jointing and reliability of the SERVQUAL scale, its dimensions and the validity of the structure as well as the conclusions thereof. I made the analysis among Hungarian retail service providers in two phases, pilot study and „confirmative” testing, by using scale reliability tests, explorative and confirmative factor analysis (principal component analysis) and the structural equation modelling (SEM).

5.1. THE PILOT-STUDY

The primary purpose of the pilot-study conducted in 2005 was to examine how the original SERVQUAL dimensions and scale can be applied, how their structure can be identified during assessment of the quality of retail services.

During the pilot-study, I applied the perception paradigm (quality = perception (performance)) instead of disconfirmation (quality = perception (performance) – expectation) to assess the service quality. During the test, I asked the answering persons to assess the service quality on a Likert-scale from one to seven (where the rate of 1 meant the end „strongly disagree”, while that of 7 meant „strongly agree”) based on 22 statements related to the original SERVQUAL dimensions. Basically, I did not change the statements defined by Parasuraman et al. (1990) as each question could be interpreted in the examined service sector, however, I „retranslated” the questions worded in a negative form. One of the reasons was that during the preliminary testing by questionnaires, the answering persons could not clearly interpret the negative questions (originally, there were 9 negative statements among the twenty-two). The other reason was that authors also followed this practice upon

refining the SERVQUAL model, due to previous criticisms (Parasuraman et al., 1993). Accordingly, I re-worded questions no. 10, 11, 12, 13, 18, 19, 20, 21 and 22 of the original questionnaire with regard to the statement's direction. I introduce the modified scale in Appendix no. 5.

40 customers of a service provider of tyre retail took part in the pilot-study. Following examination of the preliminary sample by basic statistical methods (mean, standard deviation), I conducted a reliability test and then a factor analysis concerning identification of the SERVQUAL dimensions and the validity of scale.

During testing the scale's reliability, I applied the *Cronbach- α* index while examining the dimensions by diagnostic factor analysis. I was searching for the answer whether the 22 variables reproduce the original five SERVQUAL dimensions. I conducted the explorative factor analysis by the principal component analysis using the total variance of variables. Because of the sample of few items, the pilot-study could aim only at the preliminary examination of the scale and its dimensionality and, to a certain extent, at the definition of the further directions of the research rather than at reaching deeper conclusions or at unambiguous testing of hypotheses.

5.1.1. BASIC STATISTICS AND SCALE-RELIABILITY

Examining the *means* (Table no. 10) it can be stated that the respondents assessed the endeavour to error-free activity (VAR09), the willingness to solve problems (VAR06) and helpfulness (VAR12) as the highest (in bold in the table), while they agreed with statements concerning the modern equipment (VAR01), physical appearance (VAR02) and volume of work (VAR13) the less (in italics).

The *standard deviation* is the highest at the variable VAR13 („the employees of the company are never so busy to respond your requests”) (1.612), while it is the lowest (0.757) at the statement VAR07 („The company will perform the service right the first time”). This supports that customers assess the accuracy of the service provider's performance almost uniformly.

| Item | Mean (n=40) | Std. Deviation | Item-total correlation | Cronbach α if item deleted |
|---------------------------------------------------------------------------------|----------------|-------------------|---------------------------|-----------------------------------------|
| VAR01 – XYZ Co. has modern-looking equipment. | 4,875 | 1,4533 | 0,172 | 0,929 |
| VAR02 – XYZ Co.'s physical facilities visually appealing. | 5,100 | 1,446 | 0,283 | 0,927 |
| VAR03 – XYZ Co.'s employees are neat-appearing. | 5,525 | 1,219 | 0,568 | 0,919 |
| VAR04 – Materials associated with the service are visually appealing at XYZ Co. | 6,000 | 1,012 | 0,491 | 0,921 |
| VAR05 – When XYZ Co. promises to do something by a certain time, it does so. | 5,825 | 1,238 | 0,453 | 0,922 |
| VAR06 – When you have problem, XYZ Co. shows a sincere interest in solving it. | 6,425 | 0,843 | 0,766 | 0,917 |
| VAR07 – XYZ Co. performs the service right the first time. | 6,300 | 0,757 | 0,623 | 0,919 |
| VAR08 – XYZ Co. provides its services at the time it promises to do so. | 6,075 | 1,022 | 0,425 | 0,922 |
| VAR09 – XYZ Co. insists on error-free records. | 6,525 | 0,816 | 0,592 | 0,919 |
| VAR10 – Employees of XYZ Co. tell you exactly when services will be performed. | 6,075 | 1,268 | 0,644 | 0,918 |
| VAR11 – Employees of XYZ Co. give you prompt service. | 5,700 | 1,067 | 0,450 | 0,921 |
| VAR12 – Employees of XYZ Co. are always willing to help you. | 6,400 | 0,841 | 0,632 | 0,919 |
| VAR13 – Employees of XYZ Co. are never too busy to respond to your requests. | 5,375 | 1,612 | 0,595 | 0,920 |
| VAR14 – The behavior of employees of XYZ Co. instills confidence in you. | 5,900 | 1,081 | 0,811 | 0,915 |
| VAR15 – You feel safe in your transactions with XYZ Co. | 6,275 | 1,012 | 0,821 | 0,915 |
| VAR16 – Employees of XYZ Co. are consistently courteous with you. | 6,150 | 1,001 | 0,753 | 0,916 |
| VAR17 – Employees of XYZ Co. have the knowledge to answer your questions. | 6,150 | 0,863 | 0,783 | 0,916 |
| VAR18 – XYZ Co. gives you individual attention. | 6,125 | 1,017 | 0,809 | 0,915 |
| VAR19 – XYZ Co. has operating hours convenient to all its customers. | 5,725 | 1,320 | 0,423 | 0,923 |
| VAR20 – XYZ Co. has employees who give you personal attention. | 5,750 | 1,276 | 0,588 | 0,919 |
| VAR21 – XYZ Co. has your best interest at heart. | 6,300 | 0,992 | 0,759 | 0,916 |
| VAR22 – Employees of XYZ Co. understand your specific needs. | 5,775 | 1,208 | 0,783 | 0,915 |

Table No. 10.: Basic statistics of the „pilot-study”

The highest *item-total correlation*¹⁷ were related to the following statements: VAR15 – „You as a customer of the company feel safe during transactions” (0.8212), VAR14 – „The behaviour of the company’s employees insist confidence” (0.8118) and VAR18 – „The company gives you individual attention” (0.8093). Variables, which correlated to the service quality construction the less, were the following: VAR01 – „The company has modern-looking equipment” (0.1727), VAR02 – „The company’s physical appearance are visually appealing” (0.2831), VAR19 – „The company’s operating hours are convenient for you” (0.4233). The extent of contribution to all correlations is unsteady, showing that the scale is not unidimensional, i.e. the grouping of variables is grounded.

From analysis of *Cronbach α* values calculated for the single variables, we can state that the scale’s reliability would not be increased significantly by „deletion” of any variable, apart from VAR01 and VAR02 values. Having examined the reliability of

¹⁷ The item-total correlation index suggests how much a given variable correlates to the other statements.

the whole scale, I found that the system had a quite strong internal consistency, the alpha value is 0.9231, i.e. the scale can be deemed reliable.

5.1.2. RESULTS OF THE PRINCIPAL COMPONENT ANALYSIS

The examined many variables (n=22) as compared to the low number of sample items (N=40) does not meet the $N \gg n$ requirement of the principal component analysis, thus I grouped the variables during examination in conformity to the original SERVQUAL dimensions (Table no. 11).

| Group No. | N | Variables in group | Original SERVQUAL dimension |
|-----------|---|--------------------|-----------------------------|
| 1 | 4 | VAR01-VAR04 | Tangibles |
| 2 | 5 | VAR05-VAR09 | Reliability |
| 3 | 4 | VAR10-VAR13 | Responsiveness |
| 4 | 4 | VAR14-VAR17 | Assurance |
| 5 | 5 | VAR18-VAR22 | Empathy |

Table No. 11.: Grouping of variables in the „pilot-study”

I suppose that if each principal component analysis, conducted on the variable sets grouped in accordance with the SERVQUAL dimensions gives one component as result and the portion of the partial scales is proper, then the „pilot-study” suggests that the dimensionality of the original model is suitable.

I tested the suitability for principal component analysis of the data forming the single groups by means of various methods. I examined *the correlation matrix of variables* and the *MSA values*¹⁸ and I conducted the Kaiser-Meyer-Olkin¹⁹ (KMO) and the Bartlett test²⁰ for each group. From the variance rates explained by communalities and from the formed single principal components, it can be defined how many components are „reasonable” to be formed in the system. During the

¹⁸ „The MSA (measure of sampling adequacy) is a rate between 0 and 1 in the main diagonal of the anti-image correlation matrix, „showing how close is the relation of the given variable to all other variables. Variables below the MSA-rate of 0.5 probably must be excluded from the analysis” (Sajtos, Mitev, 2007, pp. 256-257.).

¹⁹ „The KMO rate is the average of the rates to be found in the main diagonal of the anti-image correlation matrix (MSA) and it tests „whether partial correlations are acceptable” (Székelyi, Barna, 2005, p. 67.). Kaiser-Meyer-Olkin applicability test, according to which the sample is not suitable to main component analysis if the *KMO rate* is below 0.5, while the main component analysis is weak if the rate is between 0.5 and 0.7, it is average between 0.7 and 0.8 and well applicable above 0.8 (Sajtos, Mitev, 2007, p. 258.).

²⁰ „The Bartlett-test examines the lack of correlation between variables pair by pair. The significance level below 0.05 of the test shows that the measured set of variables meets the minimum requirements” (Székelyi, Barna, 2005, p. 68.).

main component analysis, I applied the Kaiser-criterion (which only considers main components with an eigenvalue of at least 1) and the percentage of variance method (where principal components are defined based on the cumulative variance). In case of several groups where the value of the new principal component was somewhat below 1 but its contribution to the explained variance was high, I conducted the analysis also with the new principal component. At the „pilot-study”, I basically examined the number of principal components determined by variables forming the single groups. Regarding eventual groups of more components, I did not do rotating and I did not examine the structure within the group.

In case of the *first variable group (Tangibles – VAR01-VAR04)*²¹, the low value of KMO (0.501) just facilitates the principal component analysis. It is also shown by the correlation matrix that the single variable pairs forming the group correlate to each other on a low level (for instance, VAR01-VAR04: $r = -0.017$), which suggests that the result of the principal component analysis concerning this group can be accepted with reservations and, that variables forming the group probably do not mean the same component because of their low correlation. The conducted principal component analysis gave two separable principal components (1st component: VAR01, VAR02; 2nd component: VAR03, VAR04), which explain together 82% of the total-variance. Interpretation of the two components is not difficult: the first principal component can clearly be connected to the internal appearance of the service provider, while the second one rather to the external one.

The internal consistency of the scale of the first variable group was just above the minimum limit of 0.6. The low Cronbach- α index also suggests that the first dimension of the original SERVQUAL (tangibles) is not suitable.

In case of the *second variable group (Reliability – VAR05-VAR09)*, the principal component analysis can be executed according to the suitability tests, although the KMO-value shows low (0.689) adequacy. Examination of the correlation coefficients shows that the correlation is low between the variables VAR05-VAR09 ($r_{5,9}=0.169$), VAR05-VAR07 ($r_{5,7}=0.276$) and VAR08-VAR09 ($r_{8,9}=0.290$), which

²¹ Detailed results of the main component analyses of the single variable groups (correlations matrix, anti-image matrix, KMO, Bartlett-test, explained variance, component matrix) can be found in Appendices 6-10.

questions the one-component solution. Although the single principal component according to the Kaiser-criterion explained 53.58 per cent of the total variance, the explained variance is already 73.16 per cent by involvement of the subsequent principal component (which has an eigenvalue of 0.979), which can rather be accepted with regard to the variable group in question. Although the scale of the original SERVQUAL's „reliability” dimension in the pilot-study (*Cronbach α = 0.773*) is average regarding the internal consistency, the principal component analysis does not clearly ground its unidimensionality. The two principal components indicated by the analysis differs statements related to „error-free services” (VAR07, VAR09) from variables related to „accuracy and problem solving” (VAR05, VAR06, VAR08).

The results of analysis of the *third variable group (Receptivity – VAR10-VAR13)* are similar to those of the second group. The KMO-value is acceptable in this case as well (0.639), the correlation between the single variables is between 0.201 ($r_{11,13}$) and 0.563 ($r_{10,13}$). Based on the criterion of the eigenvalue higher than 1, the analysis gives one principal component; however, the percentage of explained variance increases significantly, from 55.25 per cent to 76.33 per cent by involvement of the following principal component. The reliability of the scale of the third variable group (*Cronbach α = 0.706*) is acceptable. From the principal component matrix it can be seen that the VAR11 statement („the company's colleagues give you prompt service”) „is sitting on” both components, exclusively determining the second component based on factor weights. Following the Varimax rotation, the view becomes clear: one of the principal components is determined by VAR10 and VAR13 variables and the other by VAR11 and VAR12. The component determined by these latter two statements can be defined as the characteristic of „helpfulness”, however, the reading of the first principal component is not clear.

The *fourth variable group (Assurance/promise – VAR14-VAR17)* is the easiest part within the SERVQUAL scale to read and prove in all aspects. Both the appropriateness index of the principal component analysis (*KMO = 0.820*), and the reliability index of the scale of four statements (*Cronbach α = 0.909*) are very good. The correlation coefficient between the single variable pairs shows a proper value between 0.655 and 0.772 to the analysis of the principal component. As expected, the conducted analysis gives a principal component, explaining 79.02 per cent of the

total variance. The fourth variable set, materializing the original SERVQUAL scale's „assurance” dimension, seems to be proper based on the analysis of the „pilot-study”.

Examining the correlation matrix of the *variable group (VAR18-VAR22) related to the fifth dimension („Empathy”)*, it can be seen that there may be problems with the VAR19 statements („the company's operating hours are convenient for you”) as its correlation to the other variables is low ($r_{18,19} = 0.274$; $r_{19,20} = 0.293$; $r_{19,21} = 0.378$; $r_{19,22} = 0.217$). The KMO-value (0.765) is acceptable and the internal consistency of the scale of five items (*Cronbach α = 0.828*) is proper as well. During estimation of communalities, it seems to be proven that the VAR19 statement does not fit properly in the dimension determined by the other variables. The estimated communality of 0.211 related to the statement suggests that this variable does not correlate averagely to any component. Although the principal component analysis according to the Kaiser-criterion gave a principal component explaining the total variance to an acceptable extent (63.45 %), the analysis to define the two components showed that the system's structure is more stable by deletion of the VAR19 statement (the VAR19 form the second component alone), this way the variance proportion is 80.83 per cent. In the pilot-study, the result of the examination concerning the fifth set, questioned the validity of the 19th statement (VAR19) in the „empathy” dimension²².

5.1.3. A SUMMARY OF THE RESULTS OF THE PILOT-STUDY

The reliability of the partial-scales formed in accordance with SERVQUAL's dimensions (except the first variable set) proved to be average and good. The conducted principal component analyses (see Table No. 12) gave a clear solution only in case of the fourth group („assurance”), i.e. one component could be defined based on both the Kaiser-criterion and the percentage-of-variance method. In the other four cases, the two methods gave a different structure, one and two components.

²² During the subsequent refinement of SERVQUAL, Parasuraman et al. (1994b, p. 227.) transferred the 19th statement (suitable opening hours) into the dimension of tangibles.

| Group No. | Variables in the group | KMO | Cronbach α | Number of principal components (by Kaiser-criterion) | Number of principal components (by percentage-of-variance method) ²³ | Explained variance (cumulative) |
|---------------------------|------------------------|-------|-------------------|------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------|
| 1 | VAR01-VAR04 | 0,501 | 0,602 | 2 | 2 | 82,01% |
| 2 | VAR05-VAR09 | 0,689 | 0,773 | 1 | 2 | 73,16% |
| 3 | VAR10-VAR13 | 0,639 | 0,706 | 1 | 2 | 76,33% |
| 4 | VAR14-VAR17 | 0,820 | 0,909 | 1 | 1 | 79,02% |
| 5 | VAR18-VAR22 | 0,765 | 0,828 | 1 | 2 | 80,83% |
| Total scale ²⁴ | VAR01-VAR22 | - | 0,923 | - | - | - |

Table No. 12.: Results of principal component analysis at the „pilot-study”

Based on the analyses it can be stated that the *pilot-study predicts that the dimensionality of the original SERVQUAL scale is not appropriate*, which has to be proven by means of examining a sample of more items, of course.

Following study of the related literature and knowing the results of the pilot-study conducted, we can form confidently the hypothesis on the appropriateness of SERVQUAL service quality dimensions used for measuring of the quality of retail services:

H_{SERVQUAL}: The five dimensions (tangibles, reliability, responsiveness, assurance, empathy) of the SERVQUAL scale for measuring the service quality can not be identified clearly in the case of retail services.

²³ Accepted percentage of variance in the „pilot-study” is minimal 60%, which is appropriate in social researches (Sajtos, Mitev, 2007, p. 260.).

²⁴ Principal component analysis can not be performed, because besides the great number of variables (n=22) the number of elements of the sample is low (N=40), data does not satisfy the N>>n requirement.

5.2. EXAMINATION OF ADEQUACY OF THE SERVQUAL DIMENSIONS – „CONFIRMATIVE” RESEARCH

In order to identify the dimensions determining the retail service quality, it is essential to examine how the dimensions of the original SERVQUAL method (tangibles, reliability, responsiveness, assurance, empathy) are valid in this field of service. In the following, I am going to introduce the examination of the hypothesis formed following study of the results of the pilot-study and the related literature (*H_{SERVQUAL}: The five dimensions (tangibles, reliability, responsiveness, assurance, empathy) of the SERVQUAL scale for measuring the service quality can not be identified clearly in the case of retail services*) as well as of the related conclusions.

In the research, I polled customers of the tyre retail company involved in the pilot study between February and March 2006, which is generally the busiest period due to the exchange of winter and summer tyres. The questionnaire to assess the service quality²⁵ and the method of administration was the same as in the pilot study, meaning that the respondents had to assess the 22 statements of the original SERVQUAL perception scale on the Likert-scale of seven points.

During the research, 174 filled questionnaires were collected from customers, among which 11 could not be processed. I examined the data of the 163 questionnaires suitable for analysis by the SPSS 15 software set. I assured appropriateness of the data input by re-checking of the randomly selected 20 per cent of questionnaires, the result of which did not disclose any systematic fault.

The structure of the respondents by age, sex and qualification is shown by Figure No. 35. No generally accepted data are available concerning customer structure of tyre retail companies, thus the representative character of the sample applied in the research can not be assessed.

In the opinion of the top management of the asked commercial company, the structure of the sample corresponds to practical experiences. Tyre retail services are generally used by men (72%), and the age group between 20 and 40 years (58%).

²⁵ The applied questionnaire is introduced by annex 11.

The item number of the sample (n=163) in the service quality research is acceptable²⁶, this item number also meets the requirements of the applied analysis methods (principal component analysis, SEM).

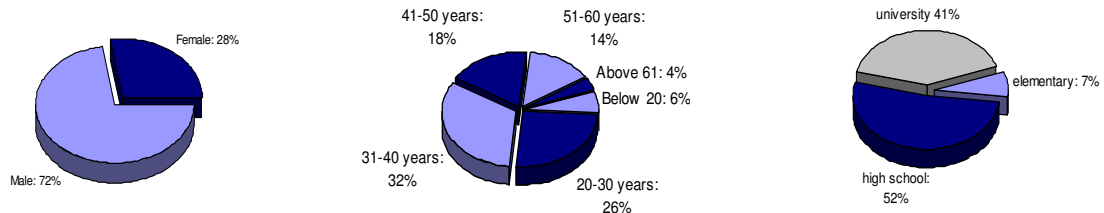


Figure No.35: Breakdown of respondents by sex, age and qualification (n=163)

5.2.1. METHOD OF THE ANALYSIS

Having examined the data by basic statistical methods, I examined the structure of the original SERVQUAL dimensions by explorative and confirmative factor analysis²⁷ and correlation analysis, while the scale's reliability by Cronbach α values.

During the explorative factor analysis, I first conducted a principal component analysis rather for confirmation²⁸, by application of the Kaiser-criterion and I conducted a Varimax rotation for the easier reading of the single components. Following the principal component analysis, I applied the SEM – Structural Equation Modeling²⁹ – as a confirmative analysis assisted by the LISREL 8.80 software set³⁰. The model mixes the factor, the variance and the regression analysis based on the co-variance matrix derived from the original data (detailed description

²⁶ Numbers of sample items applied in several researches: Parasuraman et al. (1988): credit card service (n=187), repairing and maintenance service (n=183), telephone company (n=184), bank (n=177); Cronin és Taylor (1992): fast-food restaurant (n=189), bank (n=188), insect clearing (n=175), cleaning service (n=178); Parasuraman et al. (1994): commercial network (n=180), insurance company (n=205), life insurance (n=170); Dabholkar et al. (1996): retail units (n=227); Robledo (2001): travelling by air (n_A vállalat=100, n_B vállalat=95, n_C vállalat=115); Brady et al. (2002): health (n=167), shipping (n=221), fast-food restaurant (n=309); Samat et al. (2005): bank (n=101); Lassar et al.(2005): bank (n=65); Durvasula et al. (2005): broker (n=147), life insurance (n=189).

²⁷ „The confirmative factor analysis is suitable for testing and proving an existing model. During the explorative factor analysis we create new variables and factors, the features, number and structure of which we are not aware of” (Sajtos, Mitev, 2007, p.247.).

²⁸ „The diagnostic character of the factor analysis is not unambiguous. This means that in certain cases we test a theory, examining whether the given variables will appear in the same structure again ...this is rather of confirmative character but it belongs to the category of explorative factor analyses as well” (Sajtos, Mitev, 2007, p.247.).

²⁹ The technology has several names such as covariance structure analysis (CSA), covariance structure modelling or latent variable structural modelling and structural equation model (Diamantopoulos and Siguaw, 2000, pp. 4-6).

³⁰ For details on the LISREL 8.80 programme set, please see <http://www.ssicentral.com/index.html>

of SEM can be found in Diamantopoulos' and Siguaw's (2000) work). In order to test the latent structures and to examine the model's fit³¹, I conducted first order and second order³² SEM analyses as well.

5.2.2. BASIC STATISTICS AND THE SCALE-RELIABILITY

Table No. 13 shows the means of answers to the 22 statements of the original SERVQUAL scale, its standard deviation, the item-total correlation and the Cronbach α values at exclusion of the specific statement.

Examining the *means*, it can be stated that the highest values were given to the statements concerning helpfulness (VAR12 – 6.44) and safe service provision (VAR15 – 6.44), while the answering persons assessed the physical appearance the weakest in average (VAR02 – 5.55). The mean concerning the whole scale, i.e. the service quality in fact was 6.11, which can be deemed a high score. Examining the average scores of the groups of the original SERVQUAL dimensions, the low score of the „tangibles” dimension (5.80) is apparent, while „reliability” and „assurance” dimensions play the most important roles in the service quality read pursuant to SERVQUAL. This finding corresponds to the results of Parasuraman et al. stating that „the reliability items are the most critical drivers, and the tangibles items are the least critical drivers” (Parasuraman et al., 1994a, p. 114.).

The *standard deviation* was the highest in the case of answers to the 2nd statement (“XYZ Co.’s physical facilities visually appealing”) and the 13th statement („Employees in XYZ Co. are never too busy to respond to your requests.”), which can derive from the different assessment of the different sites but even from the unambiguous reading of the statements. The „uncertainty” of the respondents is the highest in the case of the original SERVQUAL dimensions of „tangibles” and „empathy”; the standard deviation of the statements composing these dimensions exceeds 1 in all cases. Customers particularly agree that colleagues of the examined retailer „provide prompt service” to customers.

Based on the *item-total correlation*, which shows the relation of the given statement to other variables, the extent of contribution of the single variables to the total

³¹ The acceptance values of the applied fit indices is shown in Appendix 13.

³² During second-order analysis, „the common factors of the examined variables can be described as the functions of further latent variables, which are called second order factors” (Füstös et al., 2004, p. 478.).

correlation is unsteady, thus the grouping of variables is grounded. The low correlation index (0.252) of the statement related to the operating hours (VAR19) must be stressed. In conformity to the findings of the pilot study, this low score as compared to other values suggests that during the factor analysis we will have problems with these statements. Among the statements forming the „tangibles” dimension, particularly the statements concerning external appearance (VAR01, VAR02) has a low correlation index, which suggests that these two variables will form a separate factor in further analyses.

| Service quality statement | Mean (n=163) | Std. Deviation | Item-total correlation | Cronbach α if item deleted | Original dimensions (mean, Cronbach α) |
|---------------------------------------------------------------------------------|-----------------|-------------------|---------------------------|-----------------------------------------|----------------------------------------------------------|
| VAR01 – XYZ Co. has modern-looking equipment. | 5,84 | 1,26 | 0,424 | 0,940 | Tangibles mean = 5,80 α = 0,725 |
| VAR02 – XYZ Co.’s physical facilities visually appealing. | 5,55 | 1,36 | 0,404 | 0,941 | |
| VAR03 – XYZ Co.’s employees are neat-appearing. | 5,93 | 1,15 | 0,620 | 0,937 | |
| VAR04 – Materials associated with the service are visually appealing at XYZ Co. | 5,90 | 1,06 | 0,570 | 0,937 | |
| VAR05 – When XYZ Co. promises to do something by a certain time, it does so. | 6,12 | 0,98 | 0,639 | 0,936 | Reliability mean = 6,30 α = 0,890 |
| VAR06 – When you have problem, XYZ Co. shows a sincere interest in solving it. | 6,38 | 0,90 | 0,759 | 0,935 | |
| VAR07 – XYZ Co. Performs the service right the first time. | 6,33 | 0,95 | 0,686 | 0,936 | |
| VAR08 – XYZ Co. Provides its services at the time it promises to do so. | 6,35 | 0,83 | 0,541 | 0,938 | |
| VAR09 – XYZ Co. insists on error-free records. | 6,32 | 0,94 | 0,689 | 0,936 | Responsiveness mean = 6,03 α = 0,794 |
| VAR10 – Employees in XYZ Co. tell you exactly when services will be performed. | 6,19 | 1,22 | 0,749 | 0,935 | |
| VAR11 – Employees in XYZ Co. give you prompt service. | 5,73 | 0,74 | 0,548 | 0,938 | |
| VAR12 – Employees in XYZ Co. are always willing to help you. | 6,44 | 0,91 | 0,719 | 0,936 | |
| VAR13 – Employees in XYZ Co. are never too busy to respond to your requests. | 5,78 | 1,34 | 0,640 | 0,937 | Assurance mean = 6,37 α = 0,885 |
| VAR14 – The behavior of employees in XYZ Co. instills confidence in you. | 6,30 | 0,97 | 0,763 | 0,935 | |
| VAR15 – You feel safe in your transactions with XYZ Co. | 6,44 | 0,83 | 0,698 | 0,936 | |
| VAR16 – Employees in XYZ Co. are consistently courteous with you. | 6,39 | 0,91 | 0,779 | 0,935 | |
| VAR17 – Employees in XYZ Co. have the knowledge to answer your questions. | 6,36 | 0,88 | 0,796 | 0,935 | Empathy mean = 6,05 α = 0,809 |
| VAR18 – XYZ Co. gives you individual attention. | 6,16 | 1,10 | 0,758 | 0,935 | |
| VAR19 – XYZ Co. has operating hours convenient to all its customers. | 5,76 | 1,09 | 0,252 | 0,942 | |
| VAR20 – XYZ Co. has employees who give you personal attention. | 6,06 | 1,17 | 0,707 | 0,935 | |
| VAR21 – XYZ Co. has your best interest at heart. | 6,25 | 1,07 | 0,744 | 0,935 | |
| VAR22 – Employees of XYZ Co. understand your specific needs. | 6,03 | 1,25 | 0,598 | 0,937 | |

Table No. 13.: Basic statistics and scale-reliability (Cronbach α) (n=163)

The *internal consistency* of the whole scale according to the Cronbach α index is very strong ($\alpha = 0.939$). The scale’s reliability would not be increased significantly by deletion of any variable, although exclusion of the VAR19, VAR01, VAR02 statements would result in a minor improvement. The reliability of the scales of the original SERVQUAL dimensions of 4, 5, 4, 4, 5 items sequentially is proper. The order formed based on the Cronbach α scores of the partial scales reflects the order

of relative importance determined by the average of the single dimensions: the most reliable dimension-scale is „reliability” ($\alpha = 0.890$), while the less consistent scale belongs to the dimension of „tangibles” ($\alpha = 0.725$).

5.2.3. RESULTS OF THE PRINCIPAL COMPONENT ANALYSIS AND THE SEM ANALYSIS

The 22 statements of the original SERVQUAL scale determine five dimensions (tangibles, reliability, responsiveness, assurance, empathy). In order to ground this structure, I first conducted an explorative factor analysis. During examination, I conducted a principal component analysis based on the Kaiser-criterion and, in order to clarify the factor structure, I conducted Varimax rotation. Besides the basic statistics, the very good rate of the Kaiser-Meyer-Olkin index ($KMO = 0.893$), the Bartlett-test and the high MSA scores assured that the sample of 163 items was fit for principal component analysis³³.

The principal component analysis based on the eigenvalue criterion determined four components, in which, as expected following interpretation of the basic statistics, the VAR19 statement formed one component alone and the VAR01 and VAR02 variables forming the original dimension of tangibles defined one specific component as well. From the rotated component matrix arising after Varimax rotation, it can be seen that only the „reliability” can be identified clearly among the original SERVQUAL dimensions, although the VAR07 („perform the service right the first time”) and VAR09 („error-free services”) variables „are sitting on” the first component as well. The arisen four components explain 66.47 per cent of the total variance, which is an acceptable rate.

As the original SERVQUAL scale identifies five dimensions, the principal component analysis must also be conducted by determination of five components. The resulted structure (see Table no. 14) did not change significantly as compared to the solution of four components; the explaining performance of the five components is of course higher, already 70.62 per cent. The original „reliability” dimension can be noticed clearly in the structure, although the VAR07 variable continues to belong to two components. Besides the external features of tangibles (VAR01, VAR02),

³³ The detailed results of the main component analysis (anti-image matrix, KMO, Bartlett-test, communalities, explained variance) can be found in Appendix 12.

also the „internal” items related to tangibles (VAR03, VAR04) seem to be separated in this solution (the clear reading is „overshadowed” by appearance of the VAR11 statement - „prompt service provision”). The statement of the operating hours (VAR19) forms the last component here as well, which questions the role of this statement in the model. The correlation matrix (Appendix 16) also supports the results, with special regard to the 19th variable. This variable has a quite low correlation by pair against the other statements and the relation is not significant in most cases. At the VAR11 statement, a weak, non-significant relation shows only against the first and the second variable.

| | Component | | | | | Component | | | | |
|-------|-----------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 | 5 |
| VAR12 | 0,825 | | | | VAR22 | 0,754 | | | | |
| VAR11 | 0,791 | | | | VAR20 | 0,722 | | | | |
| VAR16 | 0,771 | | | | VAR21 | 0,716 | | | | |
| VAR17 | 0,733 | | | | VAR18 | 0,700 | | | | |
| VAR18 | 0,699 | | | | VAR10 | 0,697 | | | | |
| VAR10 | 0,679 | | | | VAR14 | 0,691 | | | | |
| VAR14 | 0,675 | | | | VAR16 | 0,667 | | | | |
| VAR15 | 0,654 | | | | VAR17 | 0,652 | | | | |
| VAR20 | 0,653 | | | | VAR12 | 0,623 | | 0,550 | | |
| VAR21 | 0,597 | | | 0,519 | VAR13 | 0,593 | | | | |
| VAR04 | 0,591 | | | | VAR15 | 0,532 | | | | |
| VAR22 | 0,575 | | | | VAR07 | 0,531 | 0,465 | | | |
| VAR13 | 0,572 | | | | VAR08 | | 0,883 | | | |
| VAR03 | 0,567 | | | | VAR05 | | 0,818 | | | |
| VAR07 | 0,518 | 0,506 | | | VAR06 | | 0,789 | | | |
| VAR08 | | 0,888 | | | VAR09 | | 0,602 | | | |
| VAR05 | | 0,826 | | | VAR04 | | | 0,699 | | |
| VAR06 | | 0,787 | | | VAR11 | | | 0,675 | | |
| VAR09 | 0,508 | 0,592 | | | VAR03 | | | 0,647 | | |
| VAR02 | | | 0,866 | | VAR02 | | | | 0,844 | |
| VAR01 | | | 0,791 | | VAR01 | | | | 0,800 | |
| VAR19 | | | | 0,893 | VAR19 | | | | | 0,917 |

Note: Principal component analysis, Varimax rotation (5 iterations and 8 iterations)

Table No. 14.: Rotated component matrix – four and five component – (n=163)

In the rotated component matrix, the original SERVQUAL dimensions of „responsiveness”, „assurance”, and „empathy” are mixed and form one common component.

Based on the results of the explorative principal component analysis, it can be stated that the retail service quality is determined in the examined sample by three and four (by separation of internal and external tangibles items) dimensions³⁴, contrary to the five dimensions of the original SERVQUAL model.

³⁴ Excluding the statement concerning the operating hours (VAR19) from the system.

In conformity to the results of the explorative principal component analysis, the first order SEM analysis³⁵ conducted considering the dimensionality of the original SERVQUAL scale suggested the improper fit of the original model ($\chi^2_{(172)} = 368.15$; $p = 0.000$; $GFI = 0.83$; $AGFI = 0.75$; $NFI = 0.95$; $CFI = 0.97$; $RMR = 0.049$; $RMSEA = 0.084$). Based on the model's standardized regression coefficients (see Appendix 14), the often mentioned „operating hours” (VAR19) is the less determinant item (0.31), while the „sincere interest to solve problems” (VAR06) forming the dimension of reliability is the most significant statement (0.95). There is a quite high correlation between the single latent variables (the original SERVQUAL dimensions) as well, which is particularly true for the trio of „responsiveness” – „assurance” – „empathy” (see Table no. 15). These high correlation rates also prove that the three factors separated in the original model „fuse” to one dimension.

| | | TANGIBLES | RELIAB. | RESPONS | ASSURANCE | EMPATHY |
|--------------------|------------------|-----------|---------|---------|-------------|-------------|
| Correlation | TANGIBLES | 1,000 | 0,62 | 0,74 | 0,79 | 0,71 |
| | RELIAB. | 0,53 | 1,000 | 0,75 | 0,75 | 0,73 |
| | RESPONS. | 0,56 | 0,74 | 1,000 | 0,97 | 0,91 |
| | ASSURANCE | 0,60 | 0,70 | 0,84 | 1,000 | 0,88 |
| | EMPATHY | 0,51 | 0,63 | 0,74 | 0,75 | 1,000 |

Note: Upper part of matrix shows the first order SEM's regression coefficients, lower part shows correlations

Table No. 15.: Correlation matrix and standardized regression coefficients of first order SEM

According to the second order SEM (see Appendix 15), the dimensions of „responsiveness” (0.99) and „assurance” (0.97) almost clearly determine the service quality as second order factor among the latent independent variables (i.e. the dimensions of the original SERVQUAL). The relation between the single latent variables in the second order model is high, similarly to the standardized regression coefficients of the first order model. The model's fit did not prove to be proper even during the second order analysis ($\chi^2_{(204)} = 572.4$; $p = 0.000$; $GFI = 0.76$; $AGFI = 0.70$; $NFI = 0.92$; $CFI = 0.95$; $RMR = 0.083$; $RMSEA = 0.11$), which is mostly owing to the significant cross-loading between the dimensions of „responsiveness” – „assurance” – „empathy”.

5.2.4. SUMMARY OF THE RESULTS OF THE „CONFIRMATIVE” RESEARCH, ASSESSMENT OF THE HYPOTHESIS

³⁵ First order confirmatory factor analysis

The conducted explorative and confirmative factor analyses and structural equation modeling (SEM) proved the improper fit of the original SERVQUAL scale in the case of retail service quality measuring. Among the five service quality dimensions forming the original model, only the dimension of „reliability” and „tangibles” can be identified clearly, while the other three dimensions („responsiveness”, „assurance”, „empathy”) merge into one common component. Based on the conclusions of examination of the sample of 163 items, it can be stated that *the retail service quality is a construction of more dimensions, however, the results do not support existence of the five dimensions of the original SERVQUAL*. The conclusions correspond to the results of several researches, for instance, to Parasuraman et al.’s (1991a, 1991b, 1994a, 1994b) findings made during modification of the SERVQUAL.

Based on the examinations conducted among retail services on the dimensionality of the original SERVQUAL service quality scale, considering the similar conclusions of a number of researches, **I accept** the composed $H_{SERVQUAL}$ hypothesis saying that *the five dimensions (tangibles, reliability, responsiveness, assurance, empathy) of the SERVQUAL scale for measuring the service quality **can not be identified clearly** in the case of retail services*.

6. FORMATION OF THE RETAIL SERVICE QUALITY MODEL

In the previous chapter I proved it empirically that the SERVQUAL scale and its dimensions (tangibles, reliability, responsiveness, assurance, empathy) are not suitable to measure the service quality in the case of Hungarian retail services and that the structure defined by Parasuraman et al. (1985, 1988, 1991a, 1991b, 1994a,, 1994b) and refined several times can not be applied. Thus, a retail service quality model is needed which is really suitable and valid for Hungarian retail service providers and, at the same time, it meets the requirement of the decision support system to be formed (for instance, simple applicability) and, the related scale and measuring method have to be formed as well.

In this chapter, I am introducing the formation of this model in detail, from the scale's development to the empirical analysis of the model's fit, reliability and validity. I defined the scale's items and the model's dimensions by thorough study of the related literature and making deep interviews. I involved three different retail service providers (mobile phone retailer, tyre retailer, retailer of electronic equipment) in the research, thus I examined the model's fit and my hypotheses concerning the structure considering the limits of the essay comprehensively, by means of several quantitative method of data analysis (factor analysis, reliability analysis, SEM analysis, regression calculation).

Based on the researches, I essentially managed to form a hierarchical model, which synthesizes the suggestions of several already existing models playing important roles in the related literature (Parasuraman et al., 1985, 1988; Dabholkar et al., 1996; Brady and Cronin, 2001) and the most recent researches concerning service quality (Sureshchandar et al., 2001) and which has proved suitable for the role of measuring and evaluating method in the decision support system.

At the end of the chapter, I briefly assess my hypotheses and, emphasizing the limits of the research, I define the further tasks.

6.1. FORMATION OF THE SCALE, METHOD OF THE RESEARCH

Researchers agree that scales measuring service quality are specific for each service sector and, the number and nature of the dimensions determining the service quality

depend on the examined field of service (Babakus and Boller, 1992; Chumpitaz and Swaen, 2002).

The conducted researches also supported that the dimensions of the SERVQUAL service quality scale, originally applied as a general model, were not valid among Hungarian retail services. Statements of the perception scale of the original model formed by Parasuraman et al. (1985, 1988) do not correspond properly to the single dimensions determined by them. The result of the test conducted among customers of the Hungarian tyre retailer company much rather conforms to the conclusions of the subsequent modifications (Parasuraman et al., 1994b): the service quality (the retail service quality in the specific case) is determined by dimensions of „tangibles” and „reliability” of the original model and by a third, complex dimension.

In order to form a decision support system well applicable for Hungarian retail service providers and aiming at the development of service quality, it is essential that the model measuring the quality itself must be suitable and, it must capture as many aspects of the service quality as possible. It is apparent that the SERVQUAL scale itself and its dimensions are not appropriate in retail, thus a new scale has to be determined, which can be applied easier in this field of service. I formed the scale and tested its validity by the process pursuant to Figure no. 36, by means of a number of qualitative and quantitative researches.

During formation of the scale, the recent results of service quality researches also have to be considered, with special regard to the multidimensional models and to the reading of service quality in several aspects.

In Carman's opinion, customers „are likely to break the dimension into subdimensions” (Carman, 1990, p. 37.). This opinion was supported by recent researches of service quality by formation and proving of hierarchical, multidimensional constructions, in the case of both the retail and the other service sectors (Dabholkar et al., 1996; Brady, Cronin, 2001; Kim and Jin, 2002; Ko and Pastore, 2004; Caro and Roemer, 2006; Kang, 2006).

Dabholkar et al. (1996) describe the retail service quality in a hierarchical model of three levels. The five primary dimensions (tangibles, reliability, personal interactions, problem solving, policy), each of the first three of which are determined by two further subdimensions, form one common factor, namely the

dimension of overall retail service quality. Brady and Cronin (2001) defined in their model three primary dimensions (functional/interaction quality; technical/result quality; quality of physical environment) and three further subdimensions to each of them (for details, see chapter 4.1 reviewing each service quality model).

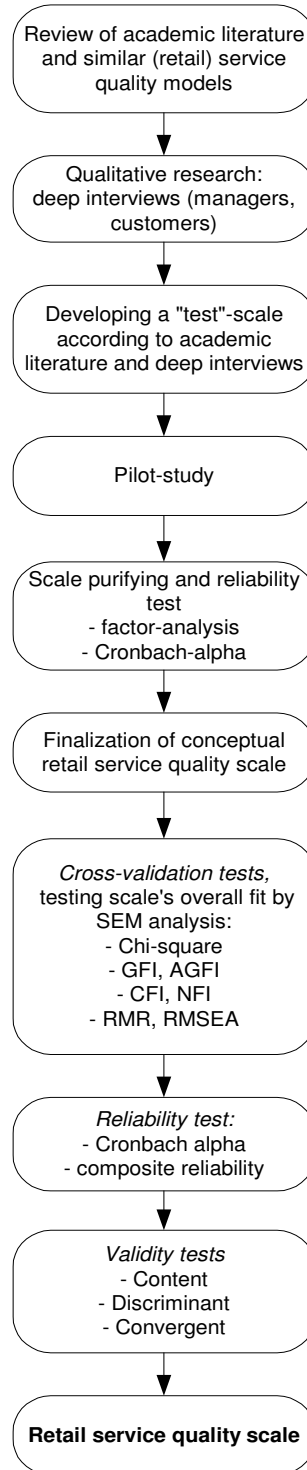


Figure No.36: Process of formation retail service quality scale

In these models, the perceived service quality is in fact a result of an assessment of several levels, where customers first assess the primary dimensions based on the single subdimensions and then, by aggregating them, the perceived service quality concerning the whole organisation.

According to Sureshchandar et al. (2001), although the original SERVQUAL scale predicts the service quality well, the statements however, rather concern only the tangible characteristics of the service and the human factors/human relations of the service process. They argue that features related to the service itself, such as the essential items of the service, the systems and standards of the service process as well as social participation of the service provider, also must be involved in the analysis so that the service quality could really be assessed in overall aspect (Sureshchandar et al., 2001). Synthesizing each model³⁶, we can draw similar conclusions: in order to assess the service quality, not only the process and technical (result) quality dimensions appearing in previous models must be indicated but also further factors have to be considered such as aspects related to the social responsibility and company policy.

6.2. PRESENTATION OF THE QUALITATIVE RESEARCH

During preparation for the qualitative research, I focused on the experiences of review of the related literature. During formation of their retail scale, Dabholkar et al. (1996), in the lack of previous experiences, applied three different qualitative technics: phenomenological interview³⁷, deep interview and „customer follow-up”³⁸. In my research, I chose the deep interview among these methods and I conducted it with colleagues and customers of various Hungarian retail service providers (tyre retail, retail of electronic equipment, furniture retail). Altogether, I asked six colleagues of the top management (managing directors and management of the three companies) and two customers in the case of each retailer. With regard to the validity and reliability of the qualitative research, it must be emphasized that although first the number of participants in the research seems to be rather low,

³⁶ Following review of the service quality models, Suuroja (2003) formed a synthesized conceptual model (see chapter 4.1 introducing Service quality models).

³⁷ During interviews, the experience of buying is described with the word of the participant (customer) and not according to the assumptions of the researcher.

³⁸ The buyer was followed continuously during buying and his value judgements, remarks, thoughts and reactions in relation to buying were recorded on tape.

similar service quality researches (Dabholkar et al., 1996; Caro, Roemer, 2006) also worked with that number of subjects or fewer. The validity of the research is increased by that participants of the deep interviews represent various commercial organisations, assessing the service quality from different points of view (top managers; operative managers). It supports the reliability that I conducted each deep interview in the same uniform way, fixing the answers.

Upon interviews of the management, I put the questions also applied by Parasuraman et al. (1985) during identification of the SERVQUAL dimensions. Namely, I wanted to know, among others, what the service of good quality in the management's opinion *generally* means from the aspect of customers of the *service field in question*, which are the *features of the ideal company* with regard to quality, which are the *factors* making customers assess the service quality in the management's opinion³⁹.

I asked the customers to define each feature by one word, which influence their assessment concerning the quality of the service in question and, to describe their characteristic experiences related to the assessment of the service quality.

I compared the information gained from the deep interviews to the findings gained during review of the related literature as well as to the generally accepted features and factors in relation to service quality. As a number of other researchers did (for instance, Dabholkar et al., 1996), I inserted the determinant, influencing factors which had already appeared in the related literature and were accepted in several previous models, in the dimensions forming the retail service quality.

The „price” as a quality-determinant feature did not come among the possible dimensions as the related literature (for instance, Bitner and Hubbert, 1994; Zeithaml, 1988, Dabholkar et al., 1996) clearly deems it a part of the service value and not a factor determining the quality. According to Brady and Cronin, „price is a component of sacrifice that defines a customer's service value assessment” (Brady and Cronin, 2001, p. 36.).

From the management interviews (for the most important answers, see Table no.16) we can draw the conclusion that personal relations play an important role in the field of retail; within this they all emphasized the importance of professional expertise,

³⁹ I present the questionnaire of the deep interview in Appendix 17.

skills and accurate provision of information. In the case of the most interaction-intensive service (furniture retailer), the asked people often stressed the features of courtesy and gentleness.

| | How would you define the <i>general</i> meaning of service of good quality from customers' point of view? | How would you define the meaning of service of good quality from customers' point of view <i>in your field of service</i>? |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tyre retailer | "Quick, accurate, professional service with skilled colleagues". | „Customers can select the suitable tyre from a wide range. The retailer colleagues can provide accurate and reliable information and serve customers quickly and professionally. Customers can receive the service (e.g. tyre exchange) on the previously agreed date. Customers can receive the important information easily and quickly (either via phone or via internet) and this information is up-to-date and accurate. Customer can easily find the site, where they can find their way simply. Customers are “handled” continually meaning that the contact is kept with them and one endeavours to provided them with customized services (e.g., they are informed in advance of the sales, of the date of tyre exchange etc.). Customers' complaints are handled by skilled colleagues.” |
| Retailer of electronic equipment | "Professional, accurate service, observance of the promised deadlines of delivery and repair" | „Professional answers and solutions should be offered to the questions. The store should be accessed easily, where parking does not cause problems. The ordered products should be delivered on time, punctually. The undertaken deadlines are observed in the service, they keep contacts with customers. Expertise of the colleagues, wide range and professional advising are essential.” |
| Furniture retailer | "A service to be used by the customer repeatedly as the mode of servicing and the range meets his requirements and even his plus expectations are satisfied." | „What the customer desires, it must be done". The customer feels that if he enters a store, everybody is for him. Colleagues are kind and polite. Customers can select the suitable products from a wide range. |

Table No. 16.: Some stressed findings of the management' deep interviews

With regard to retailers who supply tangible products to customers meaning that the service itself concerns a tangible product, the selection and fulfilment of orders prove to be important items. It is also important to come to the store easily, to find the way simply.

The quality-features defined by management and customers show considerable similarity. This indicates that the management feels from the experiences what features customers appreciate essentially upon assessing the quality, which is often reflected in the ideas on quality improvement as well. Subjects of the deep interviews denominated most often each dimension in groups, for instance, they separated features related to physical appearance, the core of the service (product of the service), business policy and personal relations. This phenomenon corresponds to Dabholkar et al.'s finding that customers in retail define their assessment concerning quality first on the level of the single characteristics and then they assess the service quality itself (on an overall level) by summarizing these (Dabholkar et al., 1996, p. 6.). I present each mentioned characteristic in the point of view of the management and customers in Appendix 18, where, besides quality-features coming

from the deep interviews, I also indicate the most important dimensions defined by the related literature for the sake of easier comparison.

By comparison of the experiences of qualitative analysis and of the results of the literature on service quality, I presumed the hierarchical model presented in Figure No. 37 as the structure of features (factors) describing the retail service quality. In the model the *physical aspects*, *reliability*, *personal interactions* and *business policy* appear as primary dimensions, determined by further subdimensions (*physical appearance*, *comfort elements*; *promise*, *error-free services*; *employee skills*, *problem solving*; *service product*, *accessibility of service*, *social aspects*). The four primary dimensions together define the superior factor, the overall retail service quality.

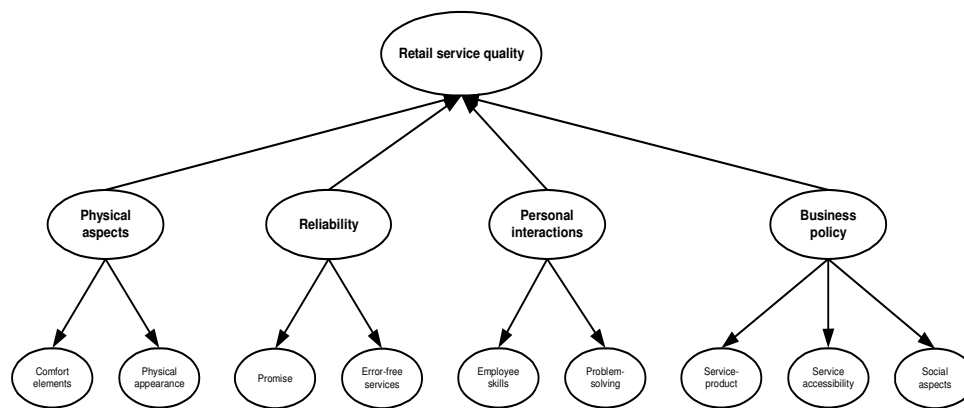


Figure No.37: Conceptual hierarchical model of retail service quality based on deep interviews

6.2.1. READING OF EACH DIMENSION, WORDING OF HYPOTHESES

The model's first dimension is formed by *physical aspects*. Bitner (1992), Dabholkar et al. (1996), Brady and Cronin (2001) agree that the tangible environment of the service provider has significant effect regarding assessment of the service quality. According to Parasuraman et al. (1985), a customer first „meets” the service provider's tangible features and this first impression significantly determines assessment of the service quality. However, tangible features mean more than SERVQUAL's „tangibles” dimension as this latter rather includes only the assessment related to the external appearance and suitability of tools. The question how modern are the tools used during service provision (computers or cash registers,

for instance) or how professional machines and pieces of equipment (tyre-centring machine, for instance) are used during services, can hardly be assessed by inexperienced customers, they rather assess based on the physical appearance, the apprehensible operability. The conducted qualitative research supported Dabholkar et al.'s (1996) conclusion that for customers, besides the *physical appearance* of tools and equipment, physical environment also includes certain aspects of *comfort* such as cleanliness, pleasant (air-conditioned) temperature, easy orientation. In Bitner's definition, "ambient conditions include background characteristics of environment, such as temperature, lighting, noise, music and scent" (Bitner, 1992, p. 66.). Conditions of comfort largely contribute to the customer's pleasant experience in relation to the service provider. In addition to the bases in the literature and findings of the qualitative research, I define the following hypotheses concerning the physical aspect of the retail service quality:

H_{physasp}: Assessment of the physical aspects of the retail service provider plays a direct role in the assessment of the overall retail service quality.

H_{physasp/1}: Assessment of the physical appearance of the service provider's tools and equipment by customers directly influences the assessment of the quality of physical aspects.

H_{physasp/2}: Assessment of the conditions of comfort related to the service directly influences the assessment of the quality of physical aspects.

The supposed second dimension of the conceptual model is *reliability*. Besides a number of researches, examination of the „pilot-study” and the SERVQUAL scale's dimensionality also supported that the reliability factor is the most identifiable and valid service quality feature from Parasuraman et al.'s (1985, 1988, 1993, 1994b) model. In qualitative analyses (mainly in the case of electronic trade), *promises* („the service performs the repair within the previously agreed deadline”, „observes the previously agreed appointments”, „in case it promised obtainment of the product, it will really do that”) can be differed from statements concerning *error-free* services („I do not need to return because they did something wrong or forgot something”, „I am served accurately and quickly”). This approach totally corresponds to Dabholkar et al.'s (1996) definition on reliability dimensions, thus, besides the stable theoretical bases, I defined the following hypotheses concerning the second factor of the conceptual model:

H_{reliab}: Assessment of the retail service provider's reliability plays a direct role in the assessment of the overall retail service quality.

H_{reliab/1}: Assessment by customers concerning observation of the service provider's promises directly influences the assessment of reliability.

H_{reliab/2}: Assessment of the service provider's error-free services directly influences the assessment of the service provider's reliability.

The third dimension of the model is formed by *personal interactions*. It is also emphasized in the service definition accepted in my essay that the most important item of services is the interaction, the relation between customer and service provider. In the classic retail purchasing process, this relation appears in an increased form, the customer identifies the service provider itself with the contact-keeping shop assistant (vendor) in many cases rather than with the organisation. The personal interaction appears in each service quality model, such as the functional quality concerning the service process itself (Grönroos, 1984), the quality of interaction (Lehtinen and Lehtinen, 1991), the SERVQUAL's dimensions of „responsiveness”, „assurance”, „empathy” (Parasuraman et al., 1988) or the quality of interaction (Brady and Cronin, 2001). Concerning personal interactions, one can find several various subdimensions in the related literature: attitude, behaviour, expertise (Brady and Cronin, 2001); behaviour, expertise, problem solving (Caro and Roemer, 2006), trust, courtesy/helpfulness (Dabholkar et al., 1996). Based on the results of my qualitative research, I defined two components in my theoretical model: employee *skills* and the quality of *problem solving*. According to the deep interviews, customers make an overall notion on the serving person keeping contact with them based on the given colleague's person, behaviour, expertise, helpfulness and competence. Dabholkar et al. (1996) defined the dimension of problem solving as a separate first order factor, however, I am of the opinion that the assessment of problem solving (handling of complaints) plays a role in the quality of personal relations. It is important mainly at retail services that complaints must be dealt with properly; taking back of the product or eventual replacement must be possible („the chair damaged during transportation was forthwith replaced”). Accepting the result of the researches of Kim and Jin (2002), as well as Caro and Roemer (2006), I deem that the quality of problem solving affects the overall service quality indirectly,

through personal relations. Accordingly, I define the following hypotheses concerning the third dimension:

H_{persint}: Assessment of the quality of the personal interaction between the customer and the colleagues of the service provider plays a direct role in the assessment of the overall retail service quality.

H_{persint/1}: Assessment by customers concerning the skills of the colleagues of the service provider directly influences the assessment of the quality of personal interactions.

H_{persint/2}: Assessment by customers concerning the quality of problem solving directly influences the assessment of the quality of personal interactions.

The last dimension of the hierarchical theoretical model is formed by *business policy*. Several features appear in this dimension, which are deemed by the related literature necessary and the importance of which was supported by the qualitative research as well („the good quality is of the same level in all sites”, „parking is solved”, „easy to reach via phone as well”, „from the wide range of products, I can find the one suitable for me”). The business policy is a widely interpreted, overall dimension, which includes the directions defined by the top management concerning service provision and the important items of the service. Although Dabholkar et al. (1996) deemed the business policy an independent factor; I examine it in the three subdimensions of *service product*, *accessibility of services* and *social aspects* in my theoretical model. According to the results of the qualitative research, Dabholkar et al.'s (1996) and Sureshchandar et al.'s (2001) recommendations, the service product subdimension is constituted by items related to the range and the quality of the offered product. The accessibility of services is formed by statements concerning the possible ways of payment, accessibility and operating hours. I integrated Sureshchandar et al.'s (2001) suggestion into the model that the social responsibility of the service provider plays a role in the assessment of the service quality. The extent and character of the social participation are determined by the top management (for instance, the service provider assures that also handicapped people use the service) therefore this must also be deemed a decision of business policy. Thus, it is a determinant of the dimension of business policy quality. With regard to the foregoing, I define the following hypotheses concerning the last factor of the model:

H_{buspol}: Assessment of the service provider's business policy plays a direct role in the assessment of the overall retail service quality.

H_{buspol/1}: Assessment by customers concerning the service product supplied by the retailer directly influences the assessment of the service provider's business policy.

H_{buspol/2}: Assessment by customers concerning accessibility of the service supplied by the retailer directly influences the assessment of the service provider's business policy.

H_{buspol/3}: Assessment by customers concerning social aspects related to the service provider directly influences the assessment of the service provider's business policy.

Summarizing the above, the assumed theoretical retail service quality model is a structure of several dimensions, in which the customer assesses the overall retail service quality through the four primary dimensions and the related nine subdimensions. Accordingly, we can define the following summarizing hypothesis concerning the whole model:

H_{retail_scale}: The retail service quality scale is a hierarchical structure of several dimensions, based on which customers assess the retail service quality through the primary dimensions and the related subdimensions.

6.3. SCALE DEVELOPMENT

Most of the service quality scales lean on Parasuraman et al.'s (1985, 1988) SERVQUAL statements, because those „based on extensive qualitative research” (Dabholkar et al., 1996, p. 8.). Although SERVQUAL statements – as proved by the critiques and my empirical researches – can not be applicable generally in each service sector. Therefore, in the course of developing retail service quality scale I took into account further retail specific statements (Dabholkar et al., 1996), and other elements, which can widen the spectrum of service quality interpretation, such as social responsibility (Sureshchandar et al., 2001).

I have retained those items from the adapted service quality scales' statements, which fitted to the factors of my model in point of conceptualization, and interpretation as well. Although some of the items have had to be modified due to translation/interpretation problems. I have generated new items related to the dimensions according to the review of academic literature and my qualitative

researches. At the end of the first step I have developed a retail service quality scale with 27 statements (see Appendix 19.).

Although critiques of SERVQUAL had pointed out that negative-worded items could have slower the administration and could have made the understanding more difficult, I have worded several statements in denying-form in my model, in order to filter the systematic „yes-no” answering, and the distortions of „fatigue-effect” (Parasuraman et al., 1985, 1988; Kenesei, Szántó, 1998).

I have used an 11-point scale to measure retail service quality, instead of the most widespread Likert-scale of 5 or 7 points. Usage of 11-degree Cantrill ladder in social researches and satisfaction measurement have been accepted and applied for a long while (Spéder, Kaptány, 2006). I used the 11-degree ladder, because this way customers can “extend” their evaluations. There is place for personal calibration, and the higher category number is more usable in conducting statistical data-analysis (reliability tests and factor analysis)⁴⁰.

6.3.1. SCALE PURIFYING, TESTING OF THE SCALE’S RELIABILITY

To ground the structure of subdimensions, I conducted a factor analysis⁴¹. *As the first step*, I examined whether the statements attached to the single assumed subdimensions really determine that given factor. *As the second step*, I conducted a (confirmative) factor analysis involving all items, testing whether the variables really relate to the dimensions assumed in the model and how strong this relation is (based on factor weights). I examined the the formed conceptual scale’s fit and its internal consistency by assessment of the Cronbach α score and the item-total correlation like Parasuraman et al. (1988) did. I assessed the single indicies based on the recommendations of Nunally (1978), Nurosis (1993) and Hair et al. (1998) concerning the acceptability scores⁴².

During preliminary analysis of the scale’s structure and reliability (pilot study), I asked university students to answer 27 statements presented in appendix 19

⁴⁰ Usage of seven or more categories is recommended in more complex staistical methods. The value of correlation coefficient is depend on the number of the scale categories. The more is the number of the scale’s categories, the higher will be the correlation coefficient. (Malhotra, 2005, p. 341).

⁴¹ I conducted the factor analysis by means of the main component analysis, the Kaiser-criterion and the varimax rotation.

⁴² Item-total correlation: above 0.30 (Nurosis, 1993); Cronbach α : above 0.7 (Nunally, 1978); factor loading: above 0.50 and, considering the number of sample items (n=100) above 0.55 (Hair et al., 1998)

concerning the retail store of their mobile phone service provider. The answering persons had to assess the service quality provided by the store in question on the scale of 11 degrees (with ends 0- not at all; 10 – totally) based on the perceived performance, i.e. the perception paradigm of the SERVPERF method. In order to test the scale, I collected totally 100 questionnaires to be processed.

Data of the scale cleaning and reliability analysis are shown by Table No. 17. During analysis, I excluded items from the original scale of 27 items which had a low item-total correlation influencing the reliability index and harmed the interpretable, uniform factor structure in the explorative factor analysis.

| | | Original no. of items | Final no. of items | Cronbach α (primary dimensions) | Cronbach α (sub-dimensions) | Item-total correlation | Factor loadings ⁴³ | Factor loadings (confirmative factor analysis) ⁴⁴ |
|-----------------------|-----------------------|-----------------------|--------------------|----------------------------------------|------------------------------------|------------------------|-------------------------------|--------------------------------------------------------------|
| Physical aspects | Comfort elements | 3 | 2 | 0,866 | 0,844 | 0,730 | 0,930 | 0,726-0,861 |
| | Physical appearance | 2 | 3 | | 0,835 | 0,677-0,726 | 0,855-0,885 | 0,671-0,831 |
| Reliability | Promise | 2 | 4 | 0,900 | 0,868 | 0,770 | 0,941 | 0,694-0,816 |
| | Error-free service | 2 | | | 0,882 | 0,790 | 0,946 | |
| Personal interactions | Employee skills | 5 | 4 | 0,869 | 0,914 | 0,687-0,838 | 0,867-0,913 | 0,612-0,809 |
| | Problem solving | 4 | 3 | | 0,837 | 0,665-0,736 | 0,848-0,890 | 0,635-0,787 |
| Business policy | Service-product | 6 | 2 | 0,774 | 0,890 | 0,822 | 0,955 | 0,882-0,941 |
| | Service accessibility | 3 | 3 | | 0,832 | 0,644-0,754 | 0,833-0,903 | 0,794-0,880 |
| | Social aspects | | 3 | | 0,836 | 0,657-0,773 | 0,841-0,910 | 0,595-0,858 |

Table No. 17.: Results of scale purifying

As a result of the test, I left three original statements out of the system⁴⁵, and I re-defined five further statements. Although the main component analysis conducted on the single subdimensions proved the preliminarily sketched, latent structure, the confirmative factor analysis did not support separation of the subdimensions of promise and error-free services, which suggests refusal of my hypotheses $H_{\text{reliab}/1}$ and $H_{\text{reliab}/2}$.

The final scale contains 12 statements of the original SERVQUAL scale, seven of Dabholkar et al.'s (1996) scale, while four of the recommendations of

⁴³ KMO values were acceptable in each principal component analysis.

⁴⁴ KMO value of confirmative principal component analysis was 0,851, the explained variance by the 8 component was 81,33%.

⁴⁵ The three statements are the following: 14. ... disregards the individual requests of the customer; 17. Directly the competent colleagues handles the problems of customers; 19. ... disregards the requests of customers upon forming the range. The item-total correlation was sequentially 0.34, 0.39, 0.41, which is still acceptable according to the limits; during the explorative principal component analysis however, they „hanged out” of the uniform structure.

Sureshchandar et al.'s (2001) model, to which I defined one further statement based on Bitner's (1992) research (Table No. 18).

Within the *physical aspects*, the subdimension of *physical appearance* is determined by the first two statements of the original SERVQUAL scale (Q1, Q2)⁴⁶ and by the statement given by Dabholkar et al. (1996) concerning proper formation and transparency of the store (Q3). The first item related to *comfort elements* (Q4) concerns cleanness of the customers' area (Dabholkar et al., 1996), while the other item of this subdimension can be attached to Bitner's (1992) finding that the temperature, scent and noise level in the customers' area closely relate to aspects of comfort (Q5).

The factor of *reliability* is determined by statements of the SERVQUAL scale (Q6, Q7, Q8, Q9) because. Namely, it was also proven by my research analysing the dimensionality of the original SERVQUAL scale besides many researches that the dimension of reliability is easily identifiable, the composing statements join properly. In the case of this component, results of the diagnostic main component analysis did not support the division into subdimensions. Among the original SERVQUAL reliability statements, the item concerning problem solving („In case you have a problem, the company shows sincere interest in solving it”) came in my model reasonably to the *problem solving* subdimension of the personal relation dimension (Q16).

Further items of the SERVQUAL scale concern mostly the *personal interaction* between the service provider and the customer. Statements to be derived from the SERVQUAL items concerning expertise (Q10), appearance and trust (Q11), helpfulness and courtesy (Q13) and prompt service provision (Q12) can be classified into the subdimension of the *employees' skills*. SERVQUAL scale deals with the issue of *problem solving*, which is an important item of the retail service quality according to qualitative researches and a first order factor of a Dabholkar et al.'s (1996) service quality model, to a less extent. Besides the already mentioned item (Q16), I defined the statements concerning this subdimension based on the deep interviews and Dabholkar et al.'s (1996) recommendations. For customers and management it determines the service of quality if complaints are treated by the

⁴⁶ In brackets, I indicate the serial number of statements arisen following scale cleaning (see Table no. 18). In bod, I stressed the negatively worded items.

competent colleague immediately (Q15) within the legal frames but without any further requirement (Q14).

| SERVQUAL dimensions (1988) | Dabholkar et.al. dimensions (1996) | Sureshchandar et.al. dimensions (2001) | Retail service quality model | | |
|----------------------------|------------------------------------|----------------------------------------|------------------------------|-----------------------|------------------------------------------------------------------------------------------------|
| | | | Primary dimension | Sub-dimension | Statement |
| Tangibles | - | - | Physical aspects | Physical appearance | Q1. This store has modern-looking equipment and fixtures |
| Tangibles | - | - | Physical aspects | Physical appearance | Q2. The physical facilities at this store are visually appealing. |
| | Physical aspects | - | Physical aspects | Physical appearance | Q3. The store layout at this store makes it easy for customers to find what they need |
| - | Physical aspects | - | Physical aspects | Comfort elements | Q4. This store has clean, attractive, and convenient public areas. |
| - | - | - | Physical aspects | Comfort elements | Q5. The ambient conditions (temperature, scent, noise, ventilation) of the store are pleasant. |
| Reliability | - | - | Reliability | - | Q6. This store provides its services at the time it promises to do. |
| Reliability | - | - | Reliability | - | Q7. This store insists on error-free transactions |
| Reliability | - | - | Reliability | - | Q8. This store performs the service right the first time. |
| Reliability | - | - | Reliability | - | Q9. When this store promises to do something by a certain time, it will do. |
| Assurance | - | - | Personal interactions | Employees skills | Q10. Employees in this store do not have the knowledge to answer customer's questions. |
| Assurance | - | - | Personal interactions | Employees skills | Q11. The behavior of employees in this store instill confidence in customers |
| Responsiveness | - | - | Personal interactions | Employees skills | Q12. Employees in this store do not give prompt service to customers |
| Responsiveness | - | - | Personal interactions | Employees skills | Q13. Employees in this store consistently courteous with customers |
| - | Problem-solving | - | Personal interactions | Problem-solving | Q14. This store willingly handles returns and exchanges |
| - | Problem-solving | - | Personal interactions | Problem-solving | Q15. Employees of this store are able to handle customer complaints directly and immediately |
| Reliability | - | - | Personal interactions | Problem-solving | Q16. When a customer has a problem, this store shows sincere interest in solving it |
| - | - | Core service | Business policy | Service product | Q17. This store offers wide range and diversity of services |
| | Policy | - | Business policy | Service product | Q18. This store offers high quality merchandise |
| - | Policy | - | Business policy | Service accessibility | Q19. This store does not provide plenty of convenient parking for customers |
| Empathy | - | - | Business policy | Service accessibility | Q20. This store operating hours not convenient to all their customers |
| - | Policy | - | Business policy | Service accessibility | Q21. This store does not accept most major credit cards |
| - | - | Social responsibility | Business policy | Social aspects | Q22. This store treats stemming from the belief, everyone, big or small, alike |
| - | - | Social responsibility | Business policy | Social aspects | Q23. This store provides service to people belonging all strata of the society |
| - | - | Social responsibility | Business policy | Social aspects | Q24. The store promotes ethical conduct in everything it does |

Table No. 18.: Retail service quality scale after scale purifying

The statements related to *business policy* come from Dabholkar et al.'s (1996) and Sureshchandar et al.'s (2001) model and the „operating hours” statement often mentioned in the earlier researches on the SERVQUAL model came to this dimension as well. Basically, the statements describe the directions determined by the management, i.e. the core service. The *service product* includes the quality of the offered product (Q18) and the extent of the range (Q17). The *accessibility of the service* and of the store in question is also important, which is also an issue of business policy. It depends on the decision of the top management which payment modes are possible (Q21), how simple is to approach the store (Q19) and how the

operating hours are formed (Q20). The *social aspects* mean exclusion of discrimination (Q22), serving handicapped people (Q23) as well as the assessment of morality of service provision (Q24). This latter means transparency of the service, moral price formation, the overall ethyc assessment of the service provider (appearance in public life, for instance) (Sureshchandar et al., 2001).

6.3.2. TESTING OF THE SCALE'S OVERALL FIT BY STRUCTURAL EQUATION MODELLING, APPLYING THE APPROACH OF PARTIAL DISAGGREGATION

Besides the conducted diagnostic and confirmative factor analyses (principal component analysis), I examined the jointing of factor structure of the retail service quality scale also by means of the structural equation modelling – SEM. However, the high number of items, subdimensions and primary dimensions composing the scale results in a complicated system, in which the SEM's approach concerning total disaggregation is backward. Despite the fact that this traditional approach of the SEM provides the most detailed analysis of the tested construction, „in practice it can be unwieldy because of likely high levels of random error in typical items and the many parameters that must be estimated” (Bagozzi and Heatherton, 1994, p. 42-43.). Researchers have stated that „measurement models have difficulty estimating over 5 parameters (indicators) for a given latent variable”; the ideal number to estimate parameters determining the latent variable is two or three (Garver, Mentzel, 1999, p. 40.).

The approach of partial disaggregation recommended and applied by several researchers (for instance, Bagozzi and Haetherton, 1994; Dabholkar et al., 1996, Garver and Mentzel, 1999) dissolves this obstacle, thus a given latent variable can be defined by means of many parameters as well. During partial disaggregation, by combining the given parameters (items) into one common item, all further advantages of structural equation can be exploited, besides decreasing the probability of random errors and simplification of the model. In practice, this means that the given latent variable can be defined in the model instead of several single-

items, by means of two or three complex indicators created by their *random*⁴⁷ combination.

The assumed retail service quality model is a hierarchical scale of three levels, which can not be tested in one step; therefore, according to the method suggested by Dabholkar et al. (1996), I examined the whole system in four subsequent phases: (1) testing of the four primary dimensions; (2) testing of the retail service quality as a second order factor related to the four primary dimensions; (3) testing of the subdimensions as first order factors; (4) testing of the primary dimensions related to the subdimensions as second order factors. According to the SEM analyses based on the partial disaggregation related to the model's single items, also the adequacy of the whole hierarchical scale can be concluded.

6.3.2.1. TESTING OF THE FOUR PRIMARY DIMENSIONS

In the first phase of the confirmative test concerning the scale's fit, I tested the adequacy of the primary dimensions of the retail service quality model: physical aspects, reliability, personal interaction, business policy. In accordance with the approach of partial disaggregation, I created two complex indicators to each dimension by random combining the scale items related to the single primary dimensions as latent variables and, I applied the structural equation modelling to this construction.

Figure No. 38 shows the standardized factor loadings (λ) of the SEM applying partial disaggregation and the covariance (Φ) values among the single dimensions. It is apparent from the rates that the relation between the single dimensions is moderate, it is the closest between personal interaction ('szemkapc') and reliability ('megbizh') ($\Phi_{32} = 0.76$). Complex indicators relate quite closely to the given latent variable, this relation can be deemed close even between business policy ('uzlpol') and the „J8” indicator giving the lowest lambda value ($\lambda_{84} = 0.71$).

⁴⁷ „The theoretic base of the random combination of items is that each indicator attached to the given latent variable joins the latent variable the same way, meaning that any combination of these items gives the same joining in the model” (Dabholkar et al., 1996, p. 10.)

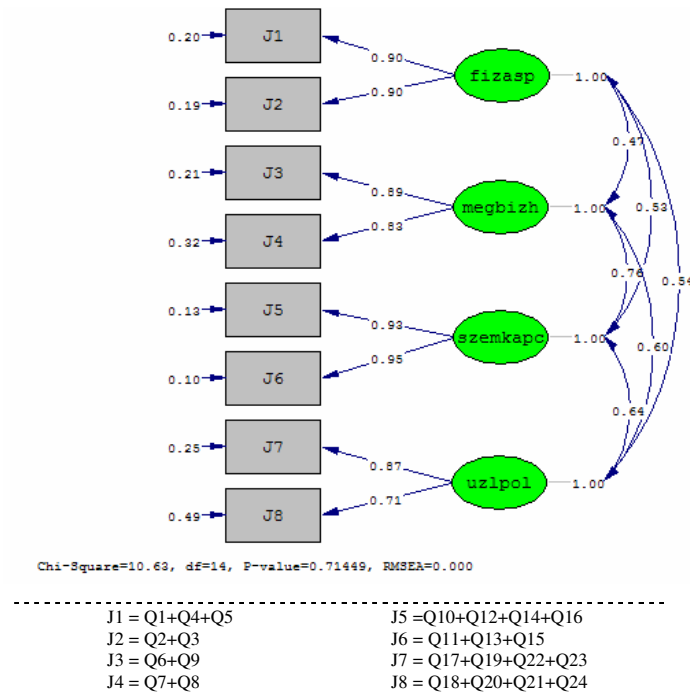


Figure No.38: Primary dimensions (SEM applying partial disaggregation)⁴⁸

The fit indices show excellent results ($\chi^2 = 1.64$, $df = 14$, $GFI = 0.974$, $CFI = 1.00$, $RMSEA = 0.000$, $RMSR = 0.059$)⁴⁹, i.e. it can be stated that *primary dimensions' fit in the retail service quality scale is acceptable*.

6.3.2.2. TESTING OF THE RETAIL SERVICE QUALITY AS A SECOND ORDER FACTOR

In the next phase, I interpreted the retail service quality as a second order factor determined by the primary dimensions. I inserted the retail service quality as a secondary latent variable into the previous structural equation modelling, I fixed the factor loading of one of the two complex indicators determining each primary dimension to the unity⁵⁰ and I made a test in this way. Figure No. 39 shows the standardized factor loadings (λ) and the relationship (γ) between exogenous (retail service quality) and endogenous latent variables (physical aspects, reliability, personal interaction, business policy). According to the second order analysis, the correlation between the single primary dimensions decreased, the highest value

⁴⁸ kermin = retail service quality; fizasp = physical aspects; megbizh = reliability; szemkapc = personal interaction; uzlpol = business policy

⁴⁹ Further fit indices can be found in Table No. 19.

⁵⁰ Latent variables, as they are unobservable, and therefore, have no scales of their own, their origin and unit of measurement have to be defined. The unit of measurement of the latent variable can be defined by determining one of the indicators related to the latent variable as reference variable (by fixing its factor loading to unity). Selection of the reference variable does not affect the standardized results (Diamantopoulos, Siguaw, 2000, p.34.)

continues to arise between personal interaction ('szemkapc') and business policy ('uzlpol') ($\Phi_{32} = 0.75$). The relation between latent variables of the single primary dimensions and the retail service quality ('kermin') is close, the retail service quality is mostly determined by the dimension of personal interaction ('szemkapc') ($\gamma_{31} = 0.90$), which explains the variance of service quality in 80.2%. Giving the importance of the single dimensions based on the explained variance of the retail service quality (R^2), the following order can be stated: personal interaction, reliability, business policy, physical aspects⁵¹.

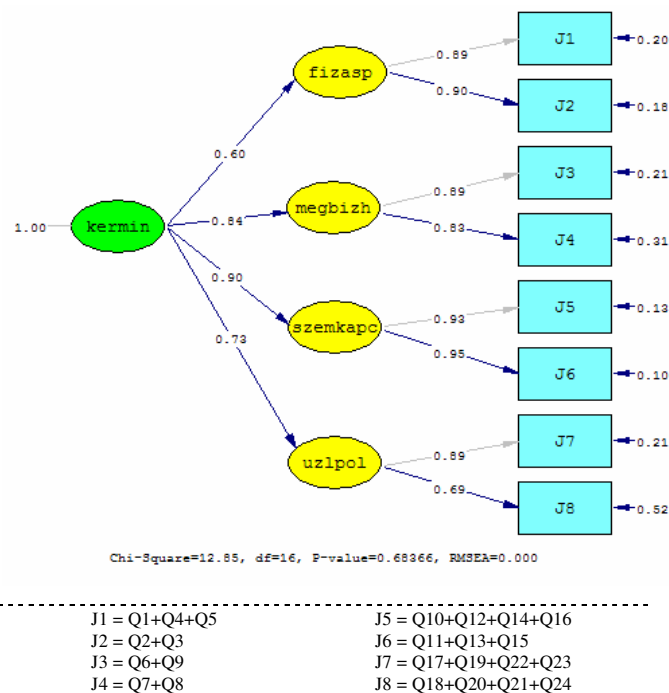


Figure No.39: Retail service quality as second order factor (SEM applying partial disaggregation)

Similarly to the first order model, the second order SEM's fit indicies give excellent values ($\chi^2 = 12.65$, $df = 16$, $GFI = 0.969$, $CFI = 1.00$, $RMSEA = 0.000$, $RMSR = 0.083$), thus the assumption that the retail service quality is determined by the primary dimensions can be accepted. Based on this the conclusion can be reached that *customers interpret the retail service quality through the four primary dimensions but as an overall concept, summarizing the value judgements concerning each dimension.*

6.3.2.3. TESTING OF THE SUBDIMENSIONS AS FIRST ORDER FACTORS

⁵¹ The related coefficients of determination (squared multiple correlation – R^2) in order: personal interaction: 0,802; reliability: 0,705; business policy: 0,528; physical aspects: 0,363

In the assumed retail service quality scale, three primary dimensions (physical aspects, personal interaction, business policy)⁵² are determined by seven further subdimensions. Similarly to the foregoing, I examine the adequacy of the single subdimensions as first order factors (latent variables) applying the approach of partial disaggregation. Figure No. 40 shows the first order SEM model, the standardized factor loadings defined therein (λ) and the coefficients between the single subdimensions (Φ). During partial disaggregation, I continued to define two complex indicators to each subdimension by random combination of the original items.

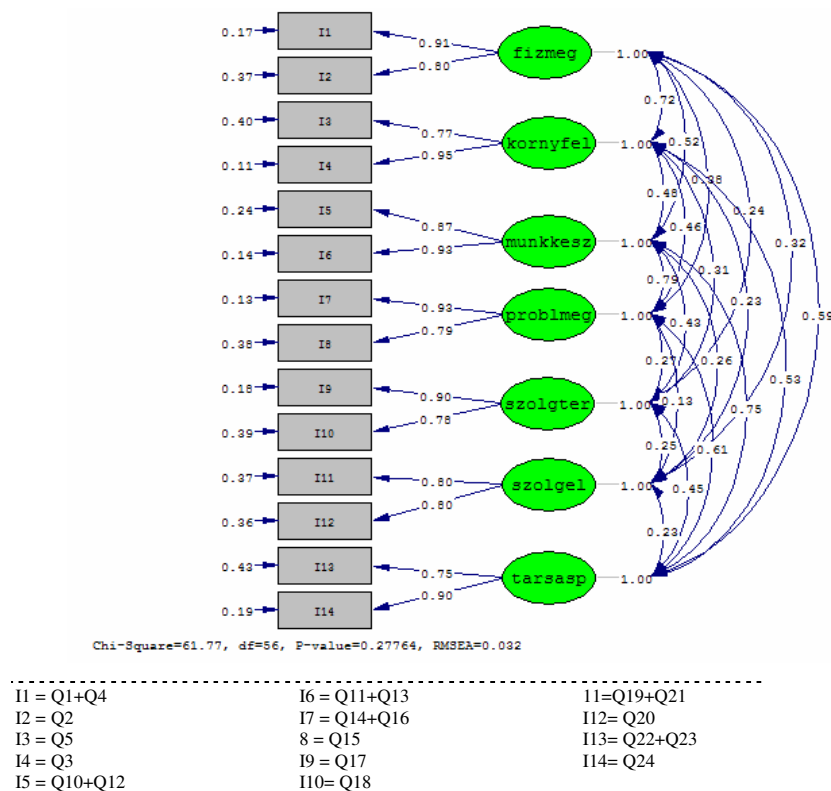


Figure No.40: Subdimensions as first order factors (SEM applying partail disaggregation)⁵³

According to the results (Φ -values), there is a positive relation between the single subdimensions and, the primary dimensions assumed by the single subdimensions seem to shape already now: the covariance between physical appearance ('fizmeg') and comfort elements ('kornyfel') shows a quite close relation ($\Phi_{21} = 0.72$), however, their relation to other subdimensions is much less close. The Φ -value of

⁵² The confirmative factor analysis (principal component analysis) conducted and introduced earlier did not support division of the fourth primary dimension (reliability) to subdimensions, so I do not examine this relation.

⁵³ fizmeg = physical appearance; kornyfel = comfort elements; munkkesz = employees' skills; problmeg = problem solving; szolgter = service product; szolgel = service accessibility; tarsasp = social aspects

the subdimension of employees' skills ('munkesz') and problem solving ('problmeg') is similarly high ($\Phi_{34} = 0.79$). The relation between the three last subdimensions (service product, service accessibility, social aspects) is low as compared to the relation between other subdimensions ($\Phi_{65} = 0.25$; $\Phi_{76} = 0.23$; $\Phi_{75} = 0.45$). The single complex indicators are in a close relation to the related latent variable, which is proven by the high λ -values.

The fit indicies of the first order SEM model applying partial disaggregation give acceptable values ($\chi^2 = 61.77$, $df = 56$, $GFI = 0.918$, $CFI = 0.998$, $RMSEA = 0.032$, $RMSR = 0.11$), thus it can be stated that *the seven subdimensions of the retail service quality scale fit the assumed structure properly*.

6.3.2.4. TESTING OF THE PRIMARY DIMENSIONS RELATED TO THE SUBDIMENSIONS AS SECOND ORDER FACTORS

In the last phase of testing the total retail service quality scale's adequacy, I tested the primary dimensions' fit related to the single subdimensions.

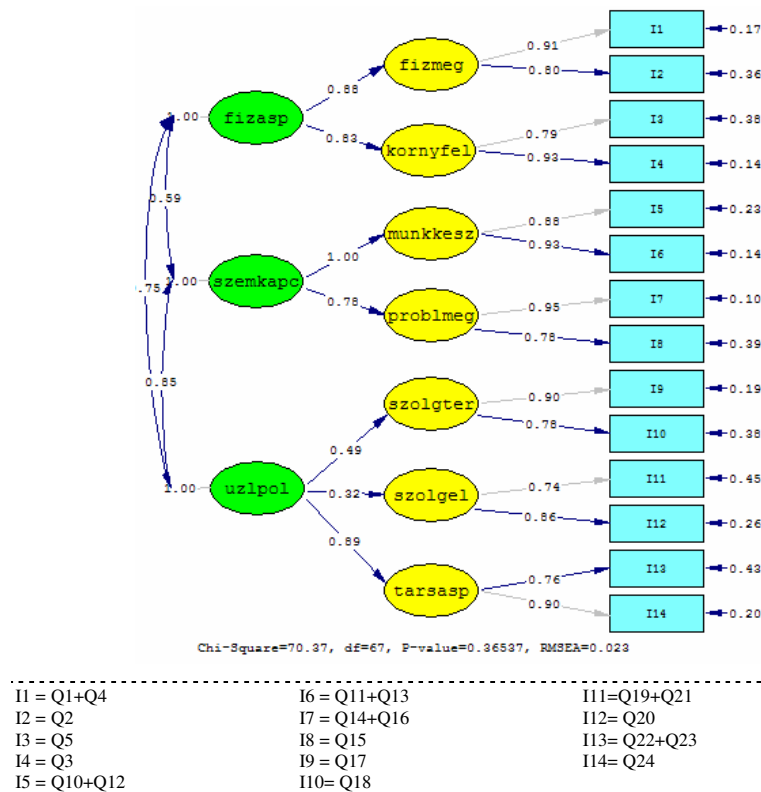


Figure No.41: Primary dimensions related to the subdimensions, as second order factors (SEM applying partial disaggregation)

The high γ -values showing the relation between the exogenous (primary dimensions) and endogenous latent variables (subdimensions) (see Figure No. 41) suggest the

hierarchical structure's fit, while the close relation between second order factors (primary dimensions) ($\Phi_{21} = 0.59$; $\Phi_{31} = 0.75$; $\Phi_{32} = 0.85$) suggest the existence of the further common factor (retail service quality).

Based on the fit indicies of the second order SEM ($\chi^2 = 70.37$, $df = 67$, $GFI = 0.908$, $CFI = 0.999$, $RMSEA = 0.023$, $RMSR = 0.15$), the adequacy of the primary dimensions determined by the subdimensions is proven in the model as well.

The conducted analyses (structural equation modelling by partial disaggregation) proved the single partial models' fit in all of the four phases, thus it can be stated that the total retail service quality model is valid.

6.3.3. CROSS-VALIDATION TESTS

I tested the validity of the theoretical retail service quality scale by analysis of the data of researches conducted in two further, independent fields of retail service. I collected the data in both fields of service, tyre trade and retail of electronical goods, in May and June 2007. I asked the customers coming into the retail store to assess the quality of the given service using the retail service quality scale formed based on my previous qualitative and quantitative researches (for the questionnaire, please see Appendix 21). The single statements of the questionnaire had to be assessed on a scale of 11 degrees (with the ends 0 – not at all; 10 – totally) pursuant to the perceived performance.

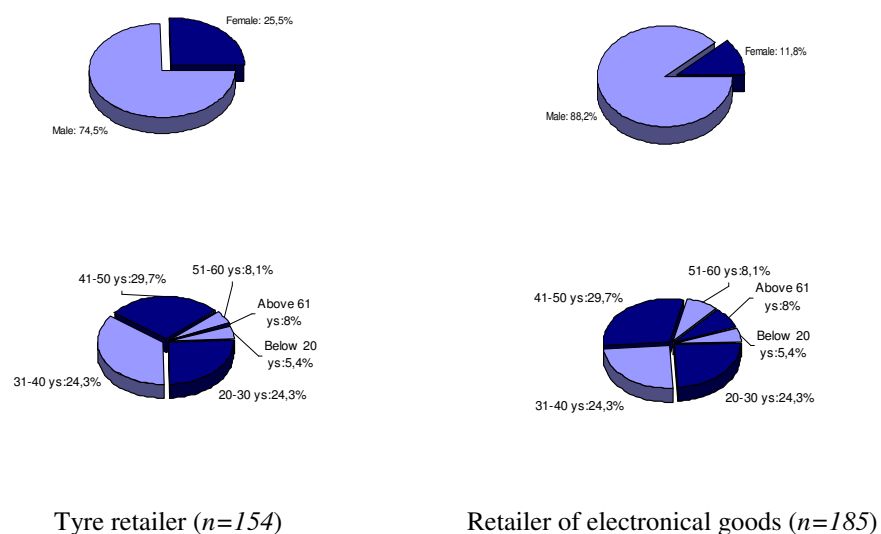


Figure No.42: Breakdown of respondents by sex and age

I collected 154 complete questionnaires from the tyre retailer companies, while 185 from the retailer of electronic equipment. Figure No. 42 shows the structure of the respondents by age and sex. Typically, men and middle-aged respondents were predominant in both cases. Appendix 22 contains the descriptive basic statistics (mean, standard deviation) concerning two different samples.

In order to test the cross validation of the assumed retail service quality scale, I tested the data of both surveys by the structural equation modelling according to the approach of partial disaggregation, by means of the method applied at the preliminary sample of students ($n = 100$). The fit indices of the single samples are summarized in Table No. 19.

| | χ^2 | df | P | GFI | $AGFI$ | CFI | NFI | $RMSR$ | $RMSEA$ |
|----------------------------------------------------------------------------------------------------|----------|------|-------|-------|--------|-------|-------|--------|---------|
| Retailer of mobile phones (preliminary student sample) ($n=100$) | | | | | | | | | |
| Testing of primary dimensions as first order factors (first order SEM) | 10,63 | 14 | 0,714 | 0,974 | 0,933 | 1,00 | 0,986 | 0,059 | 0,000 |
| Testing of retail service quality, as second order factor (second order SEM) | 12,85 | 16 | 0,683 | 0,969 | 0,929 | 1,00 | 0,982 | 0,083 | 0,000 |
| Testing of subdimensions, as first order factors (first order SEM) | 61,77 | 56 | 0,277 | 0,918 | 0,847 | 0,998 | 0,956 | 0,114 | 0,032 |
| Testing of subdimensions by related primary dimensions, as second order factors (second order SEM) | 70,37 | 67 | 0,365 | 0,908 | 0,856 | 0,999 | 0,950 | 0,155 | 0,023 |
| Tyre retailer ($n=154$) | | | | | | | | | |
| Test of primary dimensions as first order factors (first order SEM) | 13,92 | 14 | 0,455 | 0,978 | 0,943 | 1,00 | 0,989 | 0,038 | 0,000 |
| Test of retail service quality, as second order factor (second order SEM) | 15,33 | 16 | 0,500 | 0,976 | 0,945 | 1,00 | 0,988 | 0,042 | 0,000 |
| Testing of subdimensions, as first order factors (first order SEM) | 82,14 | 56 | 0,013 | 0,929 | 0,866 | 0,990 | 0,972 | 0,089 | 0,055 |
| Testing of subdimensions by related primary dimensions, as second order factors (second order SEM) | 98,10 | 67 | 0,008 | 0,916 | 0,868 | 0,987 | 0,966 | 0,108 | 0,055 |
| Retailer of electronic goods ($n=185$) | | | | | | | | | |
| Test of primary dimensions as first order factors (first order SEM) | 24,02 | 14 | 0,045 | 0,968 | 0,919 | 0,990 | 0,978 | 0,039 | 0,062 |
| Test of retail service quality, as second order factor (second order SEM) | 30,65 | 16 | 0,015 | 0,960 | 0,910 | 0,986 | 0,973 | 0,048 | 0,071 |
| Testing of subdimensions, as first order factors (first order SEM) | 97,31 | 56 | 0,005 | 0,930 | 0,868 | 0,970 | 0,937 | 0,074 | 0,063 |
| Testing of subdimensions by related primary dimensions, as second order factors (second order SEM) | 116,6 | 67 | 0,001 | 0,917 | 0,870 | 0,967 | 0,928 | 0,084 | 0,063 |

Table No. 19.: Fit indices of retail service quality scale – SEM (applying partial disaggregation)

Based on the analysis of indices,⁵⁴ it can be stated that the primary dimensions' fit as first order factors show excellent results in the case of both the tyre retailer ($\chi^2 = 13.92$, $df = 14$, $GFI = 0.978$, $CFI = 1.00$, $RMSEA = 0.00$, $RMSR = 0.038$) and the retailer of electronic goods ($\chi^2 = 24.02$, $df = 14$, $GFI = 0.968$, $CFI = 0.990$,

⁵⁴ Thresholds of the fit indices can be found in Appendix 13.

$RMSEA = 0.062$, $RMSR = 0.03$). From further examination of the table, it is apparent that in the case of both samples, also the fit indices of the conducted SEM analyses (testing of the retail service quality as second order factor, testing of subdimensions) exceed the defined thresholds i.e. they are acceptable.

6.3.4. RELIABILITY AND VALIDITY ANALYSES OF THE HIERARCHICAL RETAIL SERVICE QUALITY SCALE

I conducted further analyses to prove the reliability and validity of the retail service quality scale formed. To test the internal consistency of the whole scale and of its component primary and subdimensions, I applied the values of composite reliability calculated from the structural equation model.

| | No of elements | Reliability coefficients ⁵⁵ | | |
|-----------------------|----------------|----------------------------------------|-----------------------|--------------------------------------|
| | | Retailer of mobile phones (n=100) | Tyre retailer (n=154) | Retailer of electronic goods (n=185) |
| Whole scale | 24 | 0,963 | 0,982 | 0,955 |
| Primary dimensions | | | | |
| Physical aspects | 5 | 0,893 | 0,866 | 0,840 |
| Reliability | 4 | 0,850 | 0,938 | 0,870 |
| Personal interactions | 7 | 0,938 | 0,900 | 0,831 |
| Business policy | 8 | 0,773 | 0,898 | 0,841 |
| Subdimensions | | | | |
| Physical appearance | 3 | 0,835 | 0,782 | 0,760 |
| Comfort elements | 2 | 0,844 | 0,802 | 0,748 |
| Employees' skills | 4 | 0,895 | 0,820 | 0,831 |
| Problemsolving | 3 | 0,837 | 0,652 | 0,710 |
| Service product | 2 | 0,816 | 0,739 | 0,691 |
| Service accessibility | 3 | 0,804 | 0,697 | 0,693 |
| Social aspects | 3 | 0,836 | 0,715 | 0,769 |

Table No. 20.: Reliability values of retail service quality scale

The composite reliability is the calculated value of the standardized factor loadings of indicators related to the single latent variables and of error variances⁵⁶, the desirable value greater than 0.6 (Diamantopoulos, Siguaw, 2000, pp. 90-91.). Pursuant to Dabholkar et al.'s (1996) recommendations, I took the Cronbach α

⁵⁵ Reliability was computed as composite reliability. At dimensions with fewer than four elements I applied Cronbach α values.

⁵⁶ During calculation of composite/construct reliability considering standardized parameters, it is performed based on the following relation: $\rho_c = (\sum \lambda^2) / (\sum \lambda^2 + \sum [\theta])$, where ρ_c = composite/construct reliability, λ = standardized factor loading, θ = indicator error variances (Diamantopoulos, Siguaw, 2000, p. 90.).

reliability value into consideration for subdimensions determined by fewer than four explaining variables (see Table No. 20). The reliability of the whole retail service quality scale proved quite strong for all the three examined samples ($\rho_c(\text{mobile phone}) = 0.96$; $\rho_c(\text{tyre}) = 0.98$; $\rho_c(\text{electronic}) = 0.95$).

The internal consistency of primary dimensions is also acceptable; reliability values were high above the threshold in all cases. Although Cronbach α values are lower in the case of subdimensions and mainly in the samples of cross validation tests, all subdimensions reached or exceeded the acceptance rate suggested by Nunally ($\alpha \geq 0.70$), except for one⁵⁷. Based on examination of the reliability indices, it can be stated that the internal consistency of the whole scale as well as the scales of primary and subdimensions are adequate, they can measure the retail service quality reliably.

6.3.4.1. VALIDITY TESTS

Besides the adequate fit and reliability of the formed scale, it is important to examine whether it really measures the retail service quality in accordance with preliminary ideas, i.e. whether the validity of scale can be verified. Besides *content* validity, I examine the *convergent* and *discriminant* validity during the analyses.

6.3.4.1.1. CONTENT VALIDITY

Content validity is a „subjective but systematic assessment of how much the scale items represent the task of measuring” (Malhotra, 2005, p. 349.). Examination of content validity requires qualitative test rather than quantitative ones. All the researches in order to form the retail service quality scale and the extensive related literature introduced previously, as well as the deep interviews with managers in various fields of retail service, their experiences and modifications („scale-purification”, deleting of several items or re-definition thereof) based on the preliminary scale testing conducted among university students suggest the content validity of the scale.

Based on the feedbacks of managers asked in connection with the final scale during earlier deep interviews, it can be stated that the formed scale properly covers the „scope” of the concept of retail service quality, thus its content validity is verified.

⁵⁷ According to the sample of the tyre retailer, the Cronbach α rate of the „Problem solving” subdimension is 0.65.

6.3.4.1.2. CONVERGENT VALIDITY

The convergent validity of the retail service quality scale⁵⁸ is indirectly predicted by the high values of reliability coefficients (composite reliability, Cronbach α), which prove the existence of close relation between the items constituting the scale and its single dimensions. For the sake of further empirical testing of the convergent validity, I asked the respondents in the questionnaire to assess their „overall impression” on the perceived quality of the service delivered by the given retailer, on a scale with categories of „weak” – „acceptable” – „good” – „excellent”. During testing the convergent validity, I tested the correlation coefficients among these overall service quality rates and the whole retail service quality scale as well as the means of the single primary and subdimensions, concerning all the three samples. The correlation coefficients (see Table No. 21) showed an existing, significant relation ($p < 0.01$) between the single scale means (whole scale, primary dimensions, subdimensions) and the overall service quality, regarding each of the three fields of service.

| | Convergent validity (correlation coefficients) | | |
|-----------------------|------------------------------------------------|-----------------------|----------------------------------------|
| | Retailer of mobile phones (n=100) | Tyre retailer (n=154) | Retailer of electronical goods (n=185) |
| Whole scale | 0,70 | 0,52 | 0,67 |
| Primary dimensions | | | |
| Physical aspects | 0,43 | 0,36 | 0,34 |
| Reliability | 0,59 | 0,59 | 0,75 |
| Personal interactions | 0,65 | 0,35 | 0,53 |
| Business policy | 0,51 | 0,42 | 0,47 |
| Subdimensions | | | |
| Physical appearance | 0,49 | 0,41 | 0,35 |
| Comfort elements | 0,30 | 0,25 | 0,25 |
| Employees' skills | 0,65 | 0,36 | 0,45 |
| Problemsolving | 0,56 | 0,29 | 0,45 |
| Service product | 0,35 | 0,28 | 0,29 |
| Service accessibility | 0,22 | 0,38 | 0,37 |
| Social aspects | 0,54 | 0,44 | 0,42 |

Table No. 21.: Convergent validity of retail service quality scale

With regard to the whole scale, the correlation coefficients had a high rate between 0.52 and 0.70 in the case of the samples concerning the mobile phone retailer (preliminary sample of students), the tyre retailer and the retailer of electronical

⁵⁸ Convergent validity „shows how much a positive correlation exists between the scale and other measurements of the same concept” (Malhotra, 2005, p. 350.).

goods. Calculated coefficients show average and close (between 0.35 and 0.75) relation among dependent and independent variables in the case of primary dimensions, while weak and moderate (between 0.22 and 0.65) on the level of subdimensions.

Based on the results it can be stated that the *retail service quality scale has a strong convergent validity on the level of the whole scale and of primary dimensions, while acceptable on the level of subdimensions.*

6.3.4.1.3. DISCRIMINANT VALIDITY

I examined discriminant validity⁵⁹ of the scale by testing the correlation between the single dimensions (primary and subdimensions). If these correlation rates are significantly less than 1.00, the requirement of discriminant validity is met, while in the contrary case, presence of the second order factor (dimension) between the single dimensions is probable.

Testing the correlation coefficients between primary and subdimensions (see Appendix 23-24) we can state that these are significantly less than 1.00, thus the discriminant validity can be verified. It must be noted, however, that there is a close relation between several latent factors (dimensions) (the correlation coefficient between “physical appearance” and “comfort elements” is 0.63, for instance), which postulates the existence of a second order factor and corresponds to the hierarchical structure of the retail service quality model.

6.3.5. SUMMARY OF THE RESULTS OF THE EMPIRICAL RESEARCH

With regard to the conducted and presented tests it can be stated that the overall fit, reliability and validity of the hierarchical retail service quality scale formed to Hungarian service providers are adequate and clearly verified based on independent samples as well.

In fact, *the 24 statements of the retail service quality scale* formed based on the analyses (*Figure No. 43*) *determines seven subdimensions (physical appearance, comfort elements, employees’ skills, problem solving, service product, service*

⁵⁹ The discriminant validity refers to the fact that the scale does not correlate with the measurements of other concepts, from which it should differ based on the hypothesis (Malhotra).

accessibility, social aspects) and four primary dimensions (physical appearance, reliability, personal interactions, business policy).

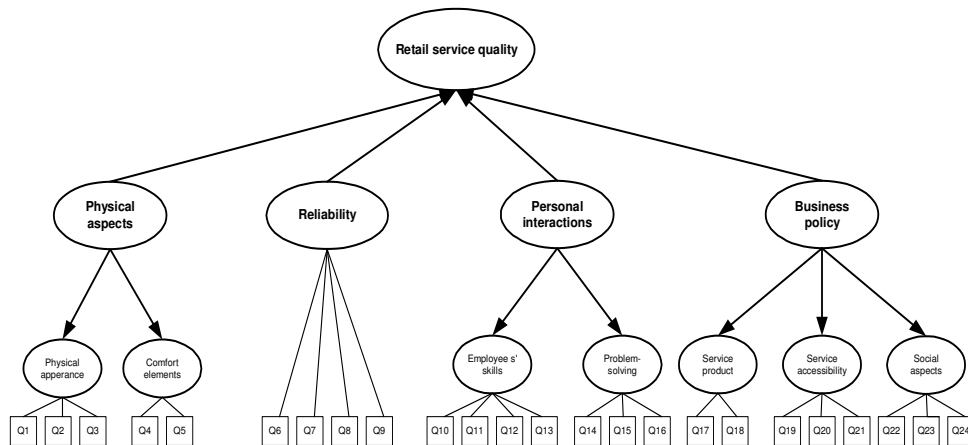


Figure No.43: Hierarchical model of retail service quality

Accordingly, customers determine the retail service quality based on the four primary dimensions (physical aspects, reliability, personal interactions, business policy) as an overall value judgement, interpreting them during assessment of the single dimensions in further subdimensions (physical appearance, comfort elements, employees' skills, problem solving, service product, service accessibility, social aspects). Thus, the retail service quality is the result of an aggregated assessment of several levels.

The hierarchical model of several levels not only serves a summarizing result concerning the quality of the retailer's service but it may also play an important role in preparing for decisions of quality improvement. Examining the level of primary dimensions, the decision-maker can get a detailed view on the ways of development by aggregating the rates related to the given dimension. Moreover, this can be broken down to the level of subdimensions when searching for more exact directions of improvement.

6.3.5.1. ASSESSMENT OF HYPOTHESES

The validity of hypotheses concerning the retail service quality scale can be tested by the presented analyses. I group and analyze the single hypotheses according to their role within the whole scale, like hypotheses related to primary dimensions and those related to subdimensions. I present the summarizing assessment of the hypotheses in Table No. 24.

6.3.5.1.1. ASSESSMENT OF HYPOTHESES RELATED TO THE PRIMARY DIMENSIONS OF THE RETAIL SERVICE QUALITY

During formation of the retail service quality scale, I prepared a multidimensional model based on the pilot-studies, qualitative researches, analysis of the related literature and deep interviews, where customers assessed the service quality based on four primary dimensions.

To test the hypotheses related to the primary dimensions, I conducted explorative and confirmative factor analysis (principal component analysis) and SEM analysis applying the approach of partial disaggregation and then I tested the reliability and validity of the single partial scales (dimensions) by means of reliability indices and linear regression calculation.

I am going to assess the hypotheses related to the single primary dimensions below, based on the foregoing analysis methods and on the results thereof.

Physical aspects

As the first direct dimension of the retail service quality scale, I assumed the physical aspects, in relation to which I defined the following hypothesis:

H_{physasp}: Assessment of the physical aspects of the retail service provider plays a direct role in the assessment of the overall retail service quality.

The dimension of physical aspects appears as a direct dimension almost in each service quality scale (Parasuraman et al., 1988; Dabholkar et al., 1996; Cronin and Brady, 2001, for instance). Factor analyses (principal component analysis) proved presence of the factor of physical aspects. The explorative main component analysis conducted based on the Kaiser-criterion gave in fact one factor for the dimension, which explained 65.3% of the total variance⁶⁰. It must be noted that the explaining power of the structure increases to 80.1% by involving one further factor, where the two possible factors exactly correspond to the assumed subdimensions.

The composite reliability indexes derived from SEM analysis exceeded the threshold in the case of each of the three samples ($\rho_c(\text{mobile phone}) = 0.89$; $\rho_c(\text{tyre}) = 0.86$; $\rho_c(\text{electronic}) = 0.84$), thus the reliability of the dimension is acceptable. It was proven during validity tests conducted based on the linear regression calculation that the

⁶⁰ I introduce results of the main component analysis based on the sample of the tyre retailer.

dimension of physical aspects can be differed and its convergent validity ($r_A = 0.43$; $r_B = 0.36$; $r_C = 0.34$) is acceptable.

It is proven by second order SEM analyses that a positive relation can be demonstrated between the dimension of physical aspects and the retail service quality as second order factor. The standardized factor loadings had sequentially the following values in the examined samples: $\gamma_A = 0.60$, $\gamma_B = 0.84$; $\gamma_C = 0.63$. The dimension of physical aspects explained the variance of retail service quality as second order factor based on the R^2 (coefficient of determination) in 36.3% in the case of the mobile phone retailer, in 71.3% in the case of the tyre retailer, while in 39.7% in the case of the retailer of electronic goods.

With regard to the foregoing, **I accept** the hypothesis ($H_{physasp}$), that assessment of the physical aspects of the retail service provider by customers plays a direct role in the assessment of the retail service quality.

Reliability

The reliability is one of the most important dimensions with the greatest explaining power in the SERVQUAL scale regarded as basis of the retail service quality scale. Based on the qualitative researches and review of the related literature, I assumed that the dimension of reliability plays an important role in my model as well, therefore I defined the following hypothesis in relation thereto:

H_{reliab}: Assessment of the retail service provider's reliability plays a direct role in the assessment of the overall retail service quality.

Both the explorative and the subsequent confirmative factor analysis supported the „existence” of the dimension in the model. Based on the requirement of the eigenvalue exceeding one, the explorative principal component analysis resulted in one component, explaining 77% of the total variance. The factor loadings are also quite high, their values varied between 0.86 and 0.90. The composite reliability values related to the dimension of reliability are similarly high, which I calculated based on the standardized factor loadings of the SEM analyses and the related variance errors ($\rho_c(\text{mobile phone}) = 0.85$; $\rho_c(\text{tyre}) = 0.94$; $\rho_c(\text{electronic}) = 0.87$), meaning that the internal consistency of reliability as partial scale is quite strong. The correlation coefficients applied to test the convergent validity support the existence of a

significant ($p < 0.01$), close and positive relation between the value judgement concerning reliability and customers' overall assessment on service quality (as dependent variable) ($r_A = 0.59$; $r_B = 0.59$; $r_C = 0.75$).

Based on the results of the second order SEM analyses it can be stated that the retail service quality as second order latent variable and the dimension of reliability are also in a positive, significant relation⁶¹ to each other, which is proven by the standardized factor loadings as well ($\gamma_A = 0.84$, $\gamma_B = 0.65$; $\gamma_C = 0.72$). The explaining power of the dimension of reliability (R^2) concerning the variance of retail service quality was the highest in the case of the mobile phone retailer ($R^2 = 70.5\%$), while the lowest in the case if the tyre retailer ($R^2 = 42.2\%$).

According to the test results, my defined hypothesis (H_{reliab}) is correct, thus **I accept** the hypothesis that customers' value judgement on reliability plays a direct role in the assessment of the retail service quality.

Personal interactions

The personal interactions of the customer and service provider plays an important role in retail services. The dimension of personal relation was clearly identified in the retail-specific service quality scales (Dabholkar et al., 1996, for instance). This was supported by the experiences of the deep interviews as well. Accordingly, I defined the following hypothesis:

H_{persint}: Assessment of the quality of the personal interactions between the customer and the colleagues of the service provider plays a direct role in the assessment of the overall retail service quality.

The explorative principal component analysis gave one component with factor loadings between 0.748 and 0.884 based on the Kaiser-criterion, which explains 66.2 per cent of the total variance, supporting the existence of the dimension of personal interactions. The high values of reliability indicies deriving from the second order SEM analysis ($\rho_c \text{ (mobile phone)} = 0.94$; $\rho_c \text{ (tyre)} = 0.90$; $\rho_c \text{ (electronic)} = 0.83$) reflect the very strong internal consistency of the personal interaction scale. The

⁶¹ The significant relation can be determined by the *t-values* calculated during LISREL's running. The *t-values* show that a given parameter significantly differs from zero in the system. The *t-values* between -1.96 and $+1.96$ shows that the given parameter does not differ significantly from zero (at a significance level of 5%) (Diamantopoulos, Siguaw, 2000, p. 60.).

dimension's convergent validity is supported by the correlation coefficients, showing significant ($p < 0.01$) relation ($r_A = 0.65$; $r_B = 0.35$; $r_C = 0.53$) to the dependent variable applied to the validity test (overall retail service quality).

The standardized factor loadings of the second order SEM analysis prove that the dimension of personal interactions and the second order latent factor of the retail service quality are in very close relation to each other; the γ -values were between 0.80 and 0.92 in the case of the examined samples. Accordingly, the preliminary hypothesis that the dimension of personal interactions plays an important role in defining the retail service quality can be verified as the explaining power of the dimension is quite high in the single samples ($R^2_A = 80.2\%$; $R^2_B = 68\%$; $R^2_C = 83.8\%$).

With regard to the foregoing results, **I accept** the $H_{persint}$ hypothesis that assessment of the personal interactions between the service provider and the customer plays a direct role in the assessment of the retail service quality.

Business policy

As compared to previous approaches, business policy is a new dimension of the retail service quality scale. Although we can find it in a number of similar scales, (Dabholkar et al., 1996, for instance), not only the previous statements concerning operating hours and range appear in relation to business policy in my model but, having accepted Sureshchandar et al.'s (2001) recommendations, also items concerning the social participation of the service provider organisation. I defined my hypothesis concerning business policy as a dimension determining the retail service quality as follows:

H_{buspol} : Assessment of the service provider's business policy plays a direct role in the assessment of the overall retail service quality.

The dimension of business policy can be identified based on the data of the explorative principal component analysis; the explained variance is 77.6 per cent. Based on the second order SEM analyses it can be stated that the dimension of business policy is closely related to the latent variable of the retail service quality in case of each of the three examined samples. Based on the sample of the mobile phone retailer, the factor loading is 0.73 and thus the explaining power of the business policy dimension is 52.8 per cent in the sample. Based on the sample of the

retailer of electronical goods, these values were similar ($\gamma = 0.75$; $R^2 = 56\%$), while business policy was the most determinant dimension in the sample of the tyre retailer, ($\gamma = 0.88$; $R^2 = 77.4\%$). Similarly to the foregoing, the reliability of the factor of business policy is acceptable, with regard to the high values of the composite reliability indices ($\rho_c(\text{mobile phone}) = 0.77$; $\rho_c(\text{tyre}) = 0.89$; $\rho_c(\text{electronic}) = 0.84$). Correlation coefficients applied during validity tests also present significant ($p < 0.01$) rates ($r_A = 0.51$; $r_B = 0.42$; $r_C = 0.47$), thus the convergent validity of the dimension is also proven. With regard to the results, **I accept** the hypothesis concerning the dimension of business policy (H_{buspol}) that the service provider's business policy plays a direct role in the assessment of the retail service quality.

6.3.5.1.2. ASSESSMENT OF HYPOTHESES CONCERNING SUBDIMENSIONS

In the assumed hierarchical structure of the retail service quality scale, customers interpret the primary dimensions as broken down to subdimensions. I tested my hypotheses concerning these subdimensions by the data analysis methods also applied to test the primary dimensions.

Subdimensions related to the primary dimensions of physical aspects (physical appearance, comfort elements)

The overall analysis of the related literature and the qualitative researches predicted that the dimension of physical aspects could be interpreted in further inferior dimensions. When assessing the physical environment, customers assess not only the tangible things but they consider certain aspects of comfort as well (Bitner, 1992; Dabholkar et al., 1996; Brady and Cronin, 2001). Based on these considerations, I defined the following two hypotheses:

$H_{physasp/1}$: Assessment of the physical appearance of the service provider's tools and equipment by customers directly influences the assessment of the quality of physical aspects.

$H_{physasp/2}$: Assessment of the comfort elements related to the service directly influences the assessment of the quality of physical aspects.

The two assumed factors constituting the dimension of physical aspects can be clearly identified based on the results of the confirmative factor analysis (principal

component analysis)⁶² (see Appendix 20). The factor loadings of „physical appearance” were between 0.67 and 0.83, while the factor weights of „comfort elements” were between 0.72 and 0.86⁶³. Based on the Cronbach α index, the scale-reliability of both subdimensions are acceptable in all of the three examined samples (see Table No. 20). The „lowest” α -values ($\alpha_{(physical\ appearance)} = 0.76$; $\alpha_{(aspects\ of\ comfort)} = 0.75$) arose in the case of the retailer of electronical goods regarding both subdimensions.

Based on the SEM analysis of the subdimensions as first order factors (see Appendices 25-26) it can be stated that the fit indices (see Table No. 19) of both the pilot-study (mobile phone retailer) and of cross validation tests (tyre retailer, retailer of electronical goods) are adequate. The high λ -values of factor loadings related to „physical appearance” and „comfort elements” as latent variables prove the existence of a close, positive relation to the composite indicators constituting them⁶⁴. The high covariance between the two latent variables ($\theta_A = 0.72$; $\theta_B = 0.86$; $\theta_C = 0.81$)⁶⁵ support the existence of a second order factor („physical aspects”).

With regard to the results, **I accept** both the $H_{physasp/1}$, and $H_{physasp/2}$ hypotheses stating that assessment of the physical appearance of the service provider’s tools and equipment by customers, as well as the assessment of the comfort elements related to the service directly influence the assessment of the retail service quality.

Subdimensions related to the primary dimension of reliability (promise, error-free services)

Based on the literature it can be stated that the dimension of reliability appears in each service quality model. Several researches read reliability as a complex concept, composed by keeping of promises on one hand and error-free service provision on the other. This differentiation can be noticed in the conducted deep interviews, therefore I defined the following hypotheses concerning the dimension of reliability: $H_{reliab/1}$: *Assessment by customers concerning observation of the service provider’s promises directly influences the assessment of reliability.*

⁶² The KMO rate of the main component analysis is 0.851.

⁶³ By analysis of the sample of the mobile phone retailer (student test).

⁶⁴ I applied the approach of partial disaggregation during SEM analyses.

⁶⁵ Bottom indexes identify the examined sample: A = mobile phone retailer; B = tyre retailer; C = retailer of electronic equipment.

H_{reliab/2}: Assessment of the service provider's error-free services directly influences the assessment of the service provider's reliability.

According to the conceptual model, nine clearly separable and interpretable components should have arisen from the confirmative factor analysis (principal component analysis) concerning subdimensions. On the contrary, the rotated component matrix (see Appendix 20) resulted in eight, really clearly interpretable components, among which the subdimensions of „error-free services” and „promise” could not be separated from each other. The composing items (Q6, Q7, Q8, Q9) belonged to one component (the dimension of „reliability”), thus the analysis did not support the structure assumed in advance.

The correlation coefficients between the single statements (Q6, Q7, Q8, Q9) present a significant ($p < 0.01$), close, positive relation of nearly the same degree in each comparison by pairs (Table No. 22), which proves the unidimensional character of the construction.

| Correlation | | Q6 | Q7 | Q8 | Q9 |
|-------------|----|-------|-------|-------|-------|
| | Q6 | 1,000 | 0,692 | 0,698 | 0,721 |
| | Q7 | 0,692 | 1,000 | 0,742 | 0,706 |
| | Q8 | 0,698 | 0,742 | 1,000 | 0,628 |
| | Q9 | 0,721 | 0,706 | 0,628 | 1,000 |

Table No. 22.: Correlation matrix of the reliability dimension's elements

With regard to these results, **I reject** my $H_{reliab/1}$ and $H_{reliab/2}$ hypotheses stating that assessment by customers concerning observation of the service provider's promises and error-free services directly influence the assessment of the service provider's reliability.

Subdimensions related to the primary dimension of personal interactions (employees' skills, problem solving)

According to the related literature and the deep interviews, the quality of the personal interaction between the colleague of the service provider and the customer is mainly based on the quality of problem solving and the assessment of the employees' skills (expertise and knowledge, for instance). Based on these considerations, I defined the following hypotheses:

H_{persint/1}: Assessment by customers concerning the skills of the employees of the service provider directly influences the assessment of the quality of personal interactions.

H_{persint/2}: Assessment by customers concerning the quality of problem solving directly influences the assessment of the quality of personal interactions.

The confirmative factor analysis clearly separated the two subdimensions (employees' skills, problem solving); the factor loadings were between 0.612 and 0.809, and between 0.635 and 0.787 respectively. The standardized factor loadings of the first order SEM analysis (λ -values) also gave high values. Furthermore, the covariance between the two subdimensions as first order factors (θ -values) was 0.79 in the case of the mobile phone retailer, 0.86 in the case of the tyre retailer and 0.60 in the case of the retailer of electronical goods, which predicted presence of the second order factor („personal interactions”). Fit indices were adequate in the first and second order SEM analyses as well, based on all of the three examined samples. The reliability of the scale related to the subdimension of „employees' skills” is acceptable on the sample of each examined retailer; the *Cronbach α -value* varied between 0.82 and 0.89. Although the criterion concerning scale-reliability deems an α -value exceeding 0.70 acceptable, I also considered the internal consistency of the partial scale of „problem solving” as adequate despite the lower ($\alpha_{(\text{tyre})} = 0.652$) value because results of the two other tests proved to be adequate ($\alpha_{(\text{mobile phone})} = 0.83$; $\alpha_{(\text{electronic})} = 0.71$).

With regard to the foregoing, **I accept** my both hypotheses concerning the subdimension related to the primary dimension of personal interactions (*H_{persint/1}* and *H_{persint/2}*).

Subdimensions related to the primary dimension of business policy (service product, accessibility of service, social aspects)

According to my knowledge, the dimension of business policy has not appeared in any service quality research in this form hitherto, with regard to the theoretical structure. The component items include the social aspects and items concerning the service as product suggested by Sureshchandar et al. (2001), completed by statements on the accessibility of the service to be read in other researches as well (Parasuraman et al., 1988; Dabholkar et al., 1996, for instance). In my opinion, all

these are principles defined by the top management of the given service provider organisation, i.e. they are part of the business policy. Therefore I defined the following hypotheses:

H_{buspol/1}: Assessment by customers concerning the service product supplied by the retailer directly influences the assessment of the service provider's business policy.

H_{buspol/2}: Assessment by customers concerning accessibility of the service supplied by the retailer directly influences the assessment of the service provider's business policy.

H_{buspol/3}: Assessment by customers concerning social aspects related to the service provider directly influences the assessment of the service provider's business policy.

The principal component analysis (confirmative factor analysis) conducted to test the hypotheses clearly proved the presence of all the three subdimensions (see Appendix 20); the factor loadings related to the items constituting the single components are acceptable. The main question was rather whether a second order factor really belongs to the three components. The answer was given by the SEM analysis, which supported the hypothesis in the case of all the three examined samples. Based on the *t-values*, covariance coefficients (Table No. 23) show significant relation between the single subdimensions.

| Mobile phone retailer | Service product | Service accessibility | Social aspects | Tyre retailer | Service product | Service accessibility | Social aspects |
|-------------------------------------|-----------------|-----------------------|----------------|-----------------------|-----------------|-----------------------|----------------|
| Service product | - | 0,25 | 0,45 | Service product | - | 0,38 | 0,59 |
| Service accessibility | 2,14 | - | 0,23 | Service accessibility | 3,17 | - | 0,53 |
| Social aspects | 4,48 | 1,97 | - | Social aspects | 8,47 | 5,23 | - |
| Retailer of electronic goods | Service product | Service accessibility | Social aspects | | | | |
| Service product | - | 0,53 | 0,46 | | | | |
| Service accessibility | 5,12 | - | 0,63 | | | | |
| Social aspects | 5,08 | 5,96 | - | | | | |

Table No. 23.: Covariance and t-values of business policy's subdimensions⁶⁶

The fit indicies (Table No. 19) proved the suitability of the whole structure. Based on the Cronbach α values (see Table No. 20), the internal consistency of all the three

⁶⁶ Upper part of the matrix presents the covariance values (θ), lower part shows t-values (the t-value between $-1,96$ és $+1,96$ shows, that a particular parameter is not significantly different from zero. (at the 5% significance level) (Diamantopoulos, Siguaw, 2000, p. 60.)).

partial scales („service product”, „service accessibility”, „social aspects”) is acceptable in the case of each sample as they varied between 0.691 and 0.836.

With regard to the foregoing results, **I accept** the $H_{buspol/1}$, $H_{buspol/2}$, $H_{buspol/3}$ hypotheses stating that the service product related to the activity of the retailer, accessibility of the service and social assessment of the organisation (social aspects) influence the assessment by customers concerning the service provider's business policy.

6.3.5.1.3. ASSESSMENT OF THE HYPOTHESIS CONCERNING THE WHOLE SCALE

According to my „summarizing” hypothesis arising from integration of the hypotheses concerning primary and subdimensions:

H_{retail_scale} : The retail service quality scale is a hierarchical structure of several dimensions, based on which customers assess the retail service quality through the primary dimensions and the related subdimensions.

Based on the summarizing results (fit indicies) arising from the analyses of SEM (Table No. 19) it can be stated that the model fit in the case of all the three samples, with regard to the models of the four primary dimensions as first order factors, the subdimensions as first order factors and the retail service quality as second order factor.

Based on the conducted analyses and the ones presented earlier, it is proven that the retail service quality as a second order factor determined by the primary dimensions, and the primary dimensions as second order factors related to the subdimensions can be identified in the model⁶⁷. Thus, the hierarchical, multidimensional structure of the retail service quality scale (Figure No. 43) is proven, i.e. **I accept** my H_{retail_scale} hypothesis.

6.3.5.2. LIMITATIONS OF THE RESEARCH, DEFINITION OF FURTHER TASKS

During formation of the retail service quality scale and testing the validity thereof, I used the assessments of customers of companies in three different fields of service concerning service quality. The cross validation tests proved the fit of the formed hierarchical scale, nevertheless, further repeated researches conducted on samples of

⁶⁷ Figures of the second order SEM analyses of subdimensions are presented in Appendix 27 (tyre retailer) and 28 (retailer of electronical goods).

more respondents could prove the model's reliability better. According to the tests, the content and conceptual (convergent and discriminant) validity of the scale is adequate as well, however, I did not examine predictive validity of the model. The new, repeated researches also could extend to the analysis of this, entirely proving the validity of the model.

| Hipotézis száma | Hipotézis tartalma | A hipotézis tesztelés eredménye |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| H_{serv_perf} | Higher service quality results in better organizational performance. In other words there is a positive correlation between the two dimensions | Accepted |
| $H_{SERVQUAL}$ | The five dimensions (tangibles, reliability, responsiveness, assurance, empathy) of the SERVQUAL scale for measuring the service quality can not be identified clearly in the case of retail services | Accepted |
| $H_{physasp}$ | Assessment of the physical aspects of the retail service provider plays a direct role in the assessment of the overall retail service quality. | Accepted |
| $H_{physasp/1}$ | Assessment of the physical appearance of the service provider's tools and equipment by customers directly influences the assessment of the quality of physical aspects. | Accepted |
| $H_{physasp/2}$ | Assessment of the comfort elements related to the service directly influences the assessment of the quality of physical aspects. | Accepted |
| H_{reliab} | Assessment of the retail service provider's reliability plays a direct role in the assessment of the overall retail service quality. | Accepted |
| $H_{reliab/1}$ | Assessment by customers concerning observation of the service provider's promises directly influences the assessment of reliability. | Rejected |
| $H_{reliab/2}$ | Assessment of the service provider's error-free services directly influences the assessment of the service provider's reliability. | Rejected |
| $H_{persint}$ | Assessment of the quality of the personal interactions between the customer and the colleagues of the service provider plays a direct role in the assessment of the overall retail service quality. | Accepted |
| $H_{persint/1}$ | Assessment by customers concerning the skills of the colleagues of the service provider directly influences the assessment of the quality of personal interactions. | Accepted |
| $H_{persint/2}$ | Assessment by customers concerning the quality of problem solving directly influences the assessment of the quality of personal interactions. | Accepted |
| H_{buspol} | Assessment of the service provider's business policy plays a direct role in the assessment of the overall retail service quality. | Accepted |
| $H_{buspol/1}$ | Assessment by customers concerning the service product supplied by the retailer directly influences the assessment of the service provider's business policy. | Accepted |
| $H_{buspol/2}$ | Assessment by customers concerning accessibility of the service supplied by the retailer directly influences the assessment of the service provider's business policy. | Accepted |
| $H_{buspol/3}$ | Assessment by customers concerning social aspects related to the service provider directly influences the assessment of the service provider's business policy. | Accepted |
| H_{retail_scale} | The retail service quality scale is a hierarchical structure of several dimensions, based on which customers assess the retail service quality through the primary dimensions and the related subdimensions. | Accepted |

Table No. 24.: Hypotheses of the dissertation

To test the scale's fit, I conducted the SEM analyses applying the partial disaggregation suggested by Bagozzi and Heatherton (1994), applied in several similar researches (Dabholkar et al., 1996, for instance). Concerning suitability of the structure of the formed scale, later, repeated researches should also consider the

application of aggregated indicators of other contents, as well as application of the method of total disaggregation instead of/besides partial disaggregation.

Service quality models can not be generalized, they are different by service sector (this was supported by Babakus and Boller, 1992; Chumpitaz and Swaen, 2002, among others). Moreover, experiences show that customers' value judgement concerning quality of the same service can be different in the various cultures, even in Europe (Witkowski and Wolfenbarger, 2002). With regard to these considerations, it must be emphasized that the retail service quality scale was formed by involvement of Hungarian retailers and their customers, and its validity is also proven in this environment. According to the feedbacks of the managers of the given retail companies, samples represented the customer base of the given service provider well. At the same time, the actual representative character of the samples can not be proven, in the lack of information concerning structure of the crowd generally utilizing retail services.

The formed scale is based on the review of the related literature and qualitative analyses. However much I endeavoured to consider all possible aspects of retail service quality, there may be factors missing from the model for any reason. Retail services also develop permanently. Retailers apply new technologies and, as a consequence of globalization, not only services (the service product and the service process) but also customer expectations change extremely rapidly. This rapidly changing environment results in regular refinement and changing of the model pursuant to the challenges of the given period, by means of qualitative and related quantitative researches. These repeated future researches, which may be conducted regularly and in a wider scope than currently, aim to insert the eventual new dimensions and approaches in the scale, assuring the long-term and continuous validity thereof.

7. QUALITY IMPROVEMENT AND DECISION SUPPORT

Based on the related literature and my empirical researches, I proved in chapter 3 that decisions related to the development of service quality significantly influence the organisational power. Accordingly, issue of the quality of decision-making must be stressed. A suitable decision support system (DSS) significantly contributes to improvement of the quality of decisions. In the previous chapter, I defined the service quality model applicable as the central measurement and assessment method of the decision support system to be formed in order to improve the retail service quality and I proved its suitability.

In this chapter, I am going to review the characteristics of the individual decision-making process, the connection points of quality, quality improvement and the related phases of decision-making. At the same time, I am going to clarify the relation between quality improvement and decision-making, as well as between quality improvement and decision support. I am going to interpret the purpose and concept of the decision support system as well as the steps of its improvement, to be really able to develop a well applicable mean improving retail service quality and supporting strategic decision-making.

7.1. PROCESS OF THE INDIVIDUAL PURCHASING DECISION

Examining the process of the individual purchasing decision (Figure No. 44), we can notice the steps of the classic decision-making process. The customer notices the problem because the status perceived by him (so-called problem status) differs from the aimed status (so-called target status). As long as this difference exists, the customer endeavours to terminate it i.e. to solve the problem. The problem can be identified by the pressure of clear factors, based on information from external sources, warning systems or problem seeking.

The first step in order to solve the problem is that the customer has to define alternative acts by collecting lots of information. When collecting the information, he can rely on his own experiences or external sources and determine more or fewer alternatives, depending on the available resources (time, money, energy, relations). During formation of alternatives, not only the subject of customer and impulses

from his environment influence the processing of information, but also his memories and perceptions (Zoltay, 2005). If the customer has bad memories or experiences concerning one specific service provider or product, he will not consider that service provider among the alternatives. Thus, the feature of satisfaction/dissatisfaction plays a role even in this phase of the decision-making process, with special regard to the fact that customers remember bad experiences better and for a longer period.

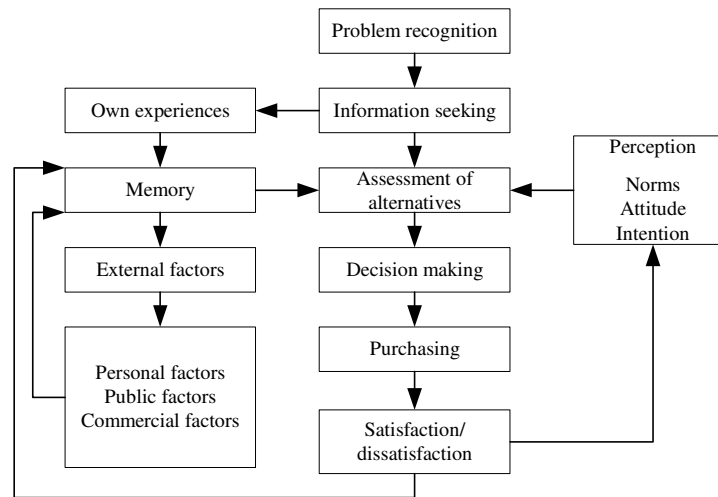


Figure No.44: Process of individual purchasing decision
(Source: Hofmeister et al., 2003, p. 26.)

The customer assesses the possible alternatives. Similarly to the formation of alternatives, both subjective and objective factors affect the phase of assessment. Besides previous experiences, satisfaction or dissatisfaction experienced in the past (on the last occasion) concerning the product or services, the perceived factors, norms, attitudes and personal preferences have significance repeatedly.

The result of assessment is the choice between alternatives, i.e. the decision. Although customers theoretically endeavour to find an optimal solution of the problem, in practice they generally have to do with the alternative satisfying their aspirations under the given aspects and circumstances. In 1978, Herbert Simon gained the Nobel-prize in economy for explanations of this phenomenon and for definition of the concept of „bounded rationality”, among others (Zoltay, 2005).

The decision is followed by the execution, i.e. by purchasing or ordering the product/service. The purchasing decision is in fact controlled by the satisfaction or dissatisfaction arising during use or utilization. These impressions come to the

customer's memory and mostly determine the intents of repeated purchasing as well as the phases of information-seeking and assessment in the next situation of decision-making.

Numerical data also prove that the satisfaction/dissatisfaction plays a significant role in customers' decision-making process: „about 94-96 per cent of dissatisfied customers [...] go away [...] and 91 per cent of these customers do not return any more; one dissatisfied customer informs 8-10 persons in average of his problem; twelve positive experiences are needed to counterbalance one single negative experience” (Neely-Adams-Kennerley, 2004, p.277.).

7.2. QUALITY IMPROVEMENT AND DECISION-MAKING

One of the main purposes of companies, either producing or servicing organisations, is to satisfy customers' expectations on the possibly highest level. However, they can realise this endeavour only in case *they improve quality continuously*. In Deming's (1982) wording, the fact that we can not meet customers' expectations is in 85% owing to processes and deficiencies of the system.

Measuring and assessment of the quality as well as feedback of the results are among the most important tasks of the management, i.e. the decision-makers of the company. To be able to reach the intended quality or even the error-free services, continuous attention and improvement are needed. Continuous improvement mixes improvement of processes, improvement of the problem-solving skill and requirement of fastidiousness.

While the quality assurance as „planned and systematic activity” focused on the „trust” in customers (EN ISO 8402:1994), new management systems (e.g. EN ISO 9001:2000 Quality Management Systems) not only require the relevant organisations to maintain the current quality level but also to increase it by continuous improvements.

One of the best-known means of quality improvement is the PDCA (plan-do-check-act) cycle (Parányi, 2005b, p. 23.), the steps of which can also correspond to the classic decision-making process (Figure No. 45). The planning phase means

recognition and definition of the problem, examination of the reasons for differences, collection of perceptions, data and information and formation of alternatives. In the phase of execution (do), the chosen solution is realised. Assessment of suitability of the executed measurements and of the decision concerning the problem corresponds to the phase of checking. In the phase of intervention (act) it can be examined whether a better decision-making process or method can be formed to solve the problem. According to continuity, the system returns to itself and it is destined to improve the achieved result, i.e. the decision-making process by starting a new cycle, in a higher level.

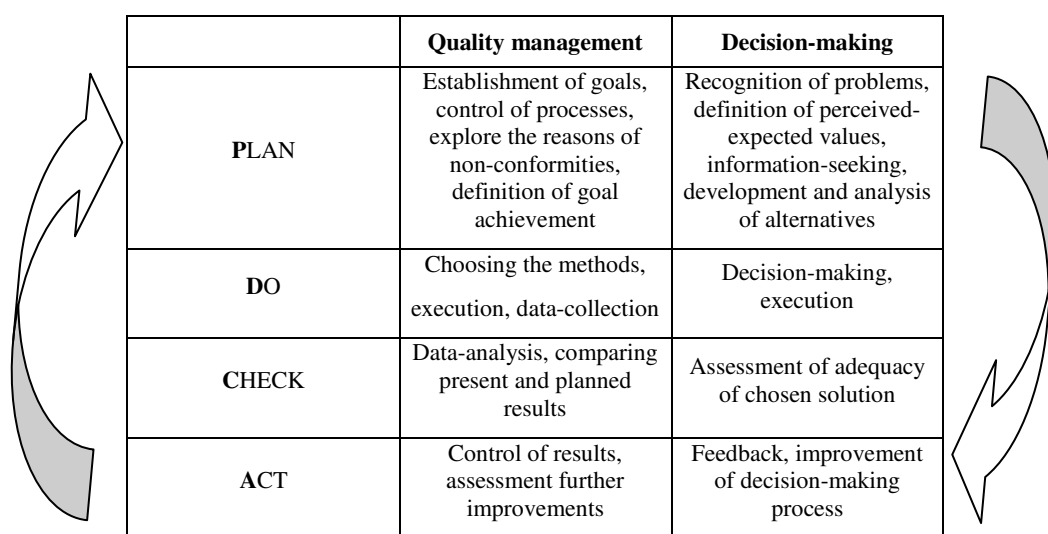


Figure No.45: PDCA and decision-making (Source: Parányi, 2005b, p. 23.)

So that a process could be improved, it has to be permanent and stable. Improvement definitely requires assessing, analyzing statistical methods, while controllable processes and powers require continuous check and feedback (Deming, 1982).

7.3. ROLE OF DECISION SUPPORT IN QUALITY IMPROVEMENT

„Management of the organisation plays a key role in achievement of the quality, whichever system of (quality) control is considered” (Kalapács, 2000). So that an organisation could start organisational changes determined by quality and standard systems, a strategic decision is definitely required. Strategic decisions are made in the study of the top management, considering a number of objective and subjective aspects determining the choice among alternative acts.

The related literature generally defines three levels based on the classification by structures of decision-making situations: well-structured, semi-structured and ill-structured decisions. The more human intelligence, experiences and intuitions are required to the solution, the less structured the decision-making situation is deemed. If the problem can be solved based on the available information within a definite period following certain algorithms, it is well-structured. It is characteristic that more less-structured decisions have to be made on the level of the strategic management, while more well-structured ones on the lower levels (management control, operative management). The colouring in Table No. 25 reflects the regularity of problems of various types arising on the single levels of decision-making. Most decisions have to be made in any of the situations represented in the diagonal.

| | Operative control | Management control | Strategic management |
|-----------------|-------------------|--------------------|----------------------|
| Well-structured | | | |
| Semi-structured | | | |
| Ill-structured | | | |

Table No. 25.: Classification of decision-making

Production control, quality checking and quality control forming part of the operative and management control are connected with well-determined computer controlling and supporting systems, functioning in stable environment with operational models. Quality management also uses models planning analysis and corrective actions as well as expert systems assessing error analysis and test results, nevertheless, decision support systems are also applicable to define quality costs (Davis, Hamilton, 1993).

Features of services (intangibility, uniqueness, inseparability, perishability) suggest that strategic decisions to improve the quality of services relate to *ill-structured* problem situations. These decision-making situations are characterized by the following:

- preferences, intuitions and experiences of the decision-maker are essential;
- searching for the solution means mixture of the following steps: searching for information, definition and formation of the problem, examination of its structure, calculations and data handling;

- the order of the above actions is not known because it may depend on the data, it may vary depending on the partial results, the solution must be given within a certain deadline and the problem changes rapidly.

During ill-structured decision-making situations, the problem is difficult to recognize and the definition of the problem may depend on the assessment of several various persons concerned. The available pieces of information are few in many occasions and, in the lack of related evaluative and analyzing methods and routines (because they are either not applicable or not available), generally *satisfactory decisions* can be made. In most cases, *uncertainty* and *changeable environment* make decision-makers to base their decisions on their *intuitions* resulting from previous experiences.

In such problem situations, all steps of the decision-making process have to be realised in order to make effective and well-grounded decisions therefore the computer system aiming at service quality improvement has to assure the following functions:

- (1) *supporting the obtainment of information*: the decision-maker firstly expects easy accessibility of the information as a support from the system. The information includes three different fields, among others: accessible data, decision-making models and means of statistical and other analysis. The support gained by the manager is the extension of his memory.
- (2) *supporting recognition of the problem*: understanding of the problem is based on recognition of the difference between the current and the aimed status. Accordingly, such display of the information means a severe help. In the phase of the problem's understanding, the decision support system may help in defining the questions to be decided or in wording a testable hypothesis.

These functions can be assured by a properly formed *decision support system (DSS)*, which handles and systematizes the input data and the models used for analysis and which discloses the results to few (top management) or more persons (operative management) through any user interface. The most important functions of the

decision support system aiming at the improvement of retail service quality can be summarized as follows:

- determination of dimensions characterizing the given service,
- creating the possibility of measurement by dimensions,
- determination of persons concerned by the given service and the assessments by those concerned (data collection),
- formation of a data base,
- conducting analyses based on the data,
- making suggestions for decision-makers based on the analyses,
- continuous maintenance and updating of the data base,
- disclosure of data for functional fields.

Main functions of the decision support system (collection and systematizing of information, decision analysis) assure that strategic decisions made in ill-structured decision-making situations result in the solution most suitable for the features and purposes of the organisation.

7.4. REVIEW OF DECISION SUPPORT SYSTEMS (DSS)

Decision Support Systems (DSS) are solutions applying computer technology, which help decision-makers to solve complex problems and to make decisions, combining the most abilities of humans and computers. „Humans have magnificent abilities to recognize the relevant factors influencing decisions, to display important information needed to clarify the ambiguous and imperfect associations and to make very exact judgments. Computers, however, are obviously much more rapid and exact than humans when handling a big mass of data. Decision support systems aim to complete the humans’ decision-making power by computers’ ability to handle data” (Zoltay, 1994).

Michael Scott Morton mentioned decision support systems in 1965 for the first time. Later in his dissertation, however, he already rejected the first definition of DSS as a computer-based information system, which helps decision-makers to solve semi-structured or unstructured (ill-structured) problems. As of the end of the 1970’s,

several researchers and companies formed interactive information systems helping managers to solve semi-structured problems by application of data bases and models. In relation to decision support systems, Little (1970) expected fulfilment of four criterion: robust form, easy manageability, simplicity and entirety. These aspects play important role in the assessment of decision support models nowadays as well.

In the wording of Keen and Scott Morton (1978), „decision support systems focus on the decision-making activity and on the needs of managers, while extending their abilities”. In their opinion, the decision support systems:

- help managers during decision-making related to semi-structured tasks,
- support and not replace their judgements,
- increase the effectiveness of decision-making rather than its efficiency.

This is achieved based on the following features:

- they support the total decision-making process,
- they use models,
- they provide managers with useful information,
- communication is possible with them in a simple but efficient language (Zoltay, 1994).

Duffy and Assad summarized the previous definitions in the concept of decision support systems. In my dissertation, I accept their definition *stating that „the Decision Support System (DSS) is an interactive, computer-based system, assuring easy accessibility to decision-making models and information”* (Duffy, Assad, 1989).

Decision support systems have to be distinguished from traditional management information systems. Decision support models may form parts of an integrated information system but they have easily definable features, clearly differing from general computer systems:

- they focus on decision-making,

- they can be easily handled by users with less skills in computer technology as well,
- they are initiated and controlled by user,
- their important features are flexibility, adaptability and rapid reactions,
- they combine application of models and analysing technologies with functions of traditional data accessibility and retrieval (Carter, Murray, Walker and Walker, 1992).

When defining the core of decision support, Phillips (1984, 1988) determined the *decision-maker*, the *information technology* and the *assessment technology* as the three main components thereof.

The *decision-maker* is essential part of the decision support model; his experiences and knowledge have to be exploited. The reference to the decision-maker reflects the principle that the freedom of decision-making has to bear the possibility of error as well. The approach of decision support does not promise incontestable solutions but only that it confronts the user with his own problem reading by its methods.

Information technology (the applied hardware and software in fact) provides assistance in collection, storage, aggregation and assessment of data and in displaying the results. By means of the information technology, future consequences of decisions can be modelled, thus the uncertainty incidental to all decisions can be decreased.

Based on *assessment technologies*, purposes of the decision-maker and aspects determining the choice between alternatives can be displayed, by which the subjective components of the decision are brought to mind and handled. Assessment technology structurally handles the information related to purposes, alternatives and assessment criteria, furthermore it clarifies priorities and the hierarchy between them, thus it can be used directly to assess consequences of choices.

Traditional decision support systems are composed of three basic elements (Sprague and Carlson, 1992):

- data base: possibilities to handle data base, with accessibility to internal and external data and information,

- model base: efficient modelling function,
- user interface: facilitates interactive polling, report making and graphic functions.

All the three elements are in interaction with each other and with the decision-maker, meaning that the computer-based decision support system is constituted by a software-controlled model, a software-controlled data base and a dialogue system creating the interaction between the user, the data base and the model (Figure No. 46).

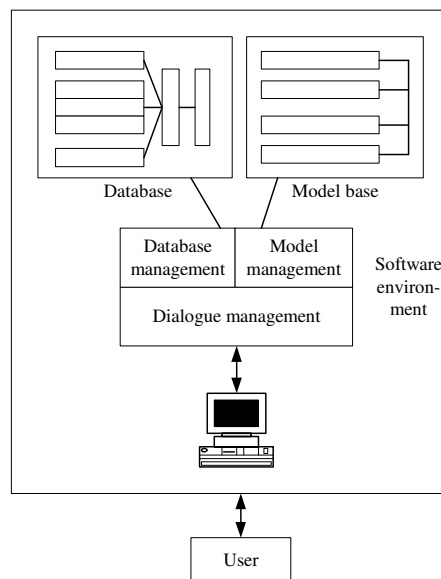


Figure No.46: Elements of traditional DSS (Source: Carter, Murray, Walker és Walker, 1992.)

The most important components of the DSS are the models applied therein. Their task is to interpret and systematize the data (statistical models), assess the alternatives (descriptive models) and to suggest acceptable solutions (normative models).

The more complicated the problem is, the more assistance can be provided by technologies helping decision-making. These technologies become the means of decision support in case they become reliable, acceptable and important part of the decision-making process. Decision support systems are computerized versions of technologies helping decision-making (Carter, Murray, Walker and Walker, 1992).

As stated by Emery, „decision support systems aim to complete the humans’ decision-making power by computers’ ability to handle data” (Zoltay, 1994, p. 7.).

DSS aims to improve the quality of the user's decision-making, which means both efficiency and effectiveness. Improvement of the efficiency of decision-making means execution of a given unit of the decision-making process rapidly, by using less resources (more rapid and less expensive decisions, for instance), while effectiveness means improvement of the quality of decisions (better decisions). Decision support may efficiently help to clarify the preferences of the decision-maker, and it may even assure that, in the case of complex problems, more than one experts be involved in seeking the solution at the same time.

7.4.1. DECISION SUPPORT SYSTEMS NOWADAYS

As of the 1990's, a significant change can be noticed in the improvement of decision support systems. Earlier the decision support meant some „diagnostics by computer”, where the individual decision-maker expected the system to form the best solution. Today the decision support systems are applied by decision-maker groups and the main purpose is to maximize the achievable advantages, profit, benefit, power etc. taking into account the existing conditions instead of defining the solution „received as finished”.

Strategic planning mostly requires predicting information originating out of the organisation, while decisions checking operation require information of the past, available inside the organisation. Early decision support systems based on past data served the operative control properly, however, they were less applicable to strategic planning. Models applying new, predicting and „what if?” type questions solve this problem and they can also be used to support decisions related to strategic planning by application of future-oriented, basically external information (Table No. 26).

| | Internal | External |
|-----------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Future-oriented | Forecasting models Business models „What if?” quaestions | Econometric models Industrial models Flight simulation |
| Historical | Management information systems, Decision support systems, Management support systems | Community/social database Community/social network |

Table No. 26.: Informationbasis of DSS (Source: Duffy, 2000.)

The rapid improvement of information technology as of the beginning of the 90's meant a turning point for decision support systems as well. Appearance of *data*

*warehouses*⁶⁸ perfected data base technologies; while *OLAP* (On-line Analytical Processing) and data processing continued to improve by appearance of *data mining*⁶⁹. The *internet* appeared as one of the most important improvement and forwarding medium of decision support systems. By means of the internet, technologic obstacles related to decision support systems decreased and the relevant information needed for decisions became easier and less expensive to reach and to process. Finally, last but not least, decision support systems became easily accessible for the wide scope of managers and employees. By means of the web-based decision support systems, managers come to the means helping them to make their decisions through an own intranet network, while customers, suppliers and other parties concerned may become active participants of the system through the internet (Shim et al., 2002).

Today, decision support models conform to managers' requests better than the econometric models applied by economists. Decision support systems are more future-oriented today and they transmit more pieces of external information, which significantly help the strategic decision-making.

The decision support model concerning the improvement of retail service quality also has to be based on future-oriented information to be reached outside the organisation through an environment of internet, assuring decision-makers to be able to determine proper strategic directions in the complicated business environment as well.

7.5. STEPS OF IMPROVEMENT OF THE DECISION SUPPORT MODEL (DSS)

Zoltay described the process of DSS improvement by the „Waterfall-model” (Figure No. 47), which determines the tasks through the order of subsequent steps (Zoltay, 1994, pp. 29-30):

- *Identification of user requests*: determination of all expectations to be met by the system.

⁶⁸ A data warehouse is a subject-oriented, integrated and stable data collection.

⁶⁹ OLAP is a category of software technology facilitating analysts, managers and top managers to reach the wide range of quick, consistent and interactive possibilities for information through the data. Nowadays OLAP means became much more dynamic but more people prefer means of data mining as means of artificial intelligence and statistical technologies to sophisticated means of data analysis.

- *Functional specification*: precise definition of the tasks to be executed by the system, description of the system's internal or functional nature.
- *Development or selection*: formation of the whole and verified system.
- *Implementation*: implementing the system in practice, installation, training.
- *Verification*: verification of DSS, i.e. that it is able to execute the expected tasks.
- *Maintenance*: execution of refinements without significant intervention to the programme.

Theoretically, the output of each phase serves as input of the next phase; although in practice we can much rather speak about an iterative process. Efficient decision support systems have to meet the following requirements (Zoltay, 1994, pp. 44-46.):

- *interactivity*: efficient, two-sided communication can be realised between the system and the decision-maker during the whole decision-making process,
- *transparency*: the system has to assure the transparency, organisation and applicability of information
- *consistency*: the system and the user should speak a common language, the system should properly react to the questions of the decision-maker,
- *intelligibility*: the system has to present the data in a form intelligible for the user,
- *sensitivity*: the system also facilitates insertion of various simulation technologies.

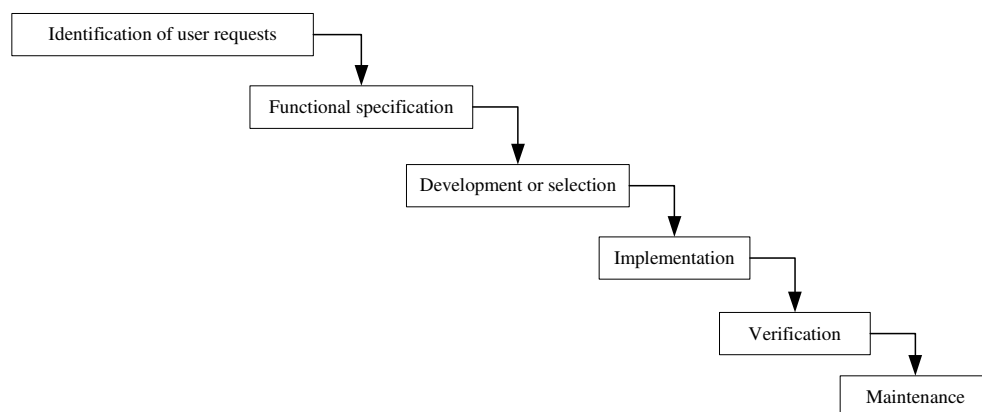


Figure No.47: Waterfall-model (Source: Zoltay, 1994)

These criteria have to be considered to the possible greatest extent when improving the decision support model concerning retail service quality improvement. It must be assured that the decision-maker and the computer system be in continuous interaction to each other in the decision support process: data be stored, reached, processed, assessed and presented in mutual workflows between the decision-maker and the programme by application of the retail service quality model.

7.5.1. A POSSIBLE PROBLEMS OF FORMATION OF THE DECISION SUPPORT SYSTEM

The related literature (Zoltay, 1994; Gelléri, 1996) defines several criticisms concerning decision support:

- (1) According to the *confirmation problem*, decision support systems may support decision-makers to follow their eventual bad ideas, they make them forget that better approaches also exist. In order to avoid this mistake, it must be emphasized that each decision support system was developed to support one type or class of problems related to decision-making. The user or the decision-making expert has to decide whether the examined problem belongs to the given class or not. If not, then it is better not to use the decision support system.
- (2) According to the *problem of the system's supposition*, computer systems are based on certain suppositions, however, the developer can not be sure whether these suppositions will be valid concerning the given application. If the user or the decision-making expert is not able to recognize whether the suppositions are valid, then application of the system can be harmful.
- (3) The *problem of the sense of responsibility* focuses on that application of decision support systems may decrease decision-makers' sense of responsibility. Namely, people feel themselves less responsible for decisions made in „co-operation” with decision support systems. It is neither clear who should be liable for a false decision: the producer or the user of the system.
- (4) according to the „*sale paradox*”, the client generally searches for a product of quite different type than offered by the decision analyst upon DSS purchasing or service use. The principal searches for a *solution* to any of his organisational problems. He acknowledges only in this connection that the

decision analyst uses some mean of decision support to find the solution. In the case of strategic advising, it often happens that finally the advisor „does not even bring out” the decision support system (Gelléri, 1996).

- (5) The core of the „*adaptation paradox*” is the contradiction how the decision analyst on one hand and the client on the other hand expects and later, what is important, experiences implementation of the decision support. Here the question is who is expected to adapt more in this situation. The decision analyst mostly accepts the existing conditions and practice of the organisation and tries to help by adapting himself to these. Namely, he tries to adapt the DSS to the organisational practice in the most obvious way. The client, however, searching for a solution to some problem, expects some *sample* to the significant reconstruction of the organisation (Gelléri, 1996).
- (6) The „*paradox of managers’ sovereignty*” represents managers’ opinion that the more independently they can decide, the less environmental support they can count on later when executing the consequences of the decision. At the same time, it will also be more difficult to protect the decision against others. Many managers think that decision-making gives them a free hand to realise ideas. It is a basic question how much a manager undertakes the normative and correct decision-making processes. The more normative and correct the decision-making process is, the more probably it will have a further participant: the advisor.

8. CONCEPTIONAL BASIS OF A DECISION SUPPORT SYSTEM FOR IMPROVEMENT OF RETAIL SERVICE QUALITY

In this chapter, I survey the conceptual basis of a decision support system for improvement of retail service quality (RSQI-DSS). I aim to outline the planned structure and operation of the model relying on the steps determined in the Waterfall-model (Zoltay, 1994) on one hand, while on the other I aim to determine the directions of further theoretical and practical researches while highlighting the presumable advantages and disadvantages of the system.

8.1. STRUCTURE OF THE PRESUMED DECISION SUPPORT SYSTEM

8.1.1. IDENTIFICATION OF USER NEEDS

The system for improvement of retail service quality is a comprehensive decision support system based on internet and intranet, aiming at quality improvement by measuring service quality. On the basis of the numerous researches described in the previous chapters of this dissertation (Zoltay, 2006; Wimmer et al., 2006), it can be stated that managing directors generally rely on their intuitions while making decisions related to quality management and quality improvement and these intuitive decisions, according to the definition of intuition itself,⁷⁰ are always based on some kind of previous experience, for example on previous data analysis. This characteristic of decision-making, verified by practice as well, must be taken into consideration when creating the decision support system.

It is strongly required that the system to be formed must have a central data base, which collects, stores and systematizes the data derived from the assessment by customers and from judgement of the service quality perceived by the given retailer customer. Using the retail service quality scale determined and verified in my dissertation as central evaluation model, it has to provide users with reliable and valid results serving as reliable basis of strategic and operative decisions. Furthermore, the system is expected to be user-friendly, meaning that its operation

⁷⁰ „Intuition is a rapid and simple way of decision-making. In most cases, it is not based in theoretical aspects. If, however, it is based on properly applied, past experiences, it may be successful” (Zoltay, 2005, p. 152.).

must be easy to understand and it also must be easy to use. It must be built on a widely used platform so that the installation of the system would not require special knowledge of computer technology. It must provide opportunity to modification or integration with other controlling systems. It must supply users with an interactive interface, through which information can be controlled, managed and results can be displayed even in a graphical form. The system must be accessible from anywhere to both customers and managers through internet or company intranet. It is useful if the system also provides certain continuity as the analyses could be followed and the efficiency of realization could be assessed through the cyclical surveys.

The main requirements concerning the decision support system for improvement of retail service quality are the following:

- availability of data base,
- accessibility (eventually on-line),
- reliability,
- simplicity,
- interactivity,
- applicability,
- possibility to integrate,
- continuity,
- dynamism.

8.1.2. FUNCTIONAL SPECIFICATION

The characteristics of the services (intangibility, heterogeneity, inseparability, perishability) imply that the situations aiming at the improvement of service quality are ill-structured⁷¹ problem situations, where the solution is not given or not trivial. The decisions concerning the improvement of service quality are made in a rapidly changing, complex environment in a basically intuitive way. Therefore, the conceptual decision support system must be able to produce data which can be accessed on-line quickly and information derived from their analysis in order to

⁷¹ „In ill-structured decision-making situation, the decision-maker has to apply judgments, evaluations and suppositions when defining the problem. These decision-making situations are generally important and are not of routine-character and no universally accepted technologies are available to solve them” (Zoltay, 2005, p. 41.).

assist decision-makers in improving the efficiency and effectiveness of their decisions.

The most important functions of the decision support system to be formed are summarized in the following:

- data collection,
- formation and maintenance of the data base,
- data analysis according to the central model/method,
- presentation of results to decision-makers according to the analyses, ensuring accessibility.

The system manages and systematizes incoming data, analyses and assesses results through the central model (retail service quality scale) and makes them accessible to a selected (top management) or a wider (operative management) audience through a user interface in a graphic way.

Data collection is carried out personally or through the internet (on-line) by assessment of the 24 statements of the retail service quality scale. Customers have to assess the statements on the grounds of the perceived performance related to the given service using the 11 degrees determined in the scale. On the one hand, the system must facilitate manual data input, while on the other it must ensure the storage of on-line incoming data. It must systematize and store the collected data and must be able to “reproduce” them in a systematized form if needed.

The central methodology of the decision support system consists of the retail service quality scale and the assessment model based on it. The selection of the assessment methodology related to the central model treads on delicate ground: a decision must be made based on disconfirmation (meaning the difference between expectations and perceived quality) or merely on the assessment of perceived quality. On the basis of the arguments and counter-arguments described in the previous chapters of my dissertation (chapter 4.2.: SERVQUAL model; chapter 4.3: Critiques of the SERVQUAL model), I prefer the application of the latter one, i.e. the assessment methodology. I am not going to describe the discussions concerning the paradigms and my conclusions drawn from them in detail but I have to highlight that although

the disconfirmation paradigm has a greater diagnostical potency according to numerous researchers (Parasuraman et al. 1991a, for instance), which can be important in case of a decision support system, in my opinion the easier usability, greater statistic reliability and validity of the perception paradigm are of greater account. As regards to decision support system, easy usability and simple data collection are extremely important, thus the application of the multi-scale assessment system (disconfirmation paradigm) is not recommended. The assessment based only on perception eliminates the problems related to the concept of expectation (see chapter 4.3.5.) and, on the other hand, the programming, calculation and interpretation thereof are also simpler.

On the basis of the retail service quality model to be applied, quality values appear on three levels: (1) overall service quality (2) quality of primary dimensions (3) quality of subdimensions. The single service quality rates can be given by aggregation (average) of the rates related to the statements concerning the given dimensions,

$$(1) \quad RSQ = \frac{1}{24} \sum_{i=1}^{24} P_i, \quad (2)-(3) \quad SQ_j = \frac{1}{n} \sum_{k=1}^n P_k$$

where:

RSQ = overall retail service quality

SQ_j = customer assessment on the j-th primary dimension (subdimension)

i = number of statements in the retail service quality scale

n = total number of elements/statements constituting the j-th primary dimension (subdimension)

k = number of statements belonging to the j-th primary dimension (subdimension)

P_i = customer assessment related to the i-th statement

P_k = customer assessment on the k-th statement belonging to the j-th primary dimension (subdimension)

The decision-maker may choose from the single levels depending on how detailed and deep information he needs concerning the service quality.

Of course, it is questionable to what the decision-maker can compare the service quality results measured on different levels if the expectations are not known. In other words: in which cases is service quality good, acceptable or bad. Again, I am not going to describe the researches concerning the role of expectations once again in detail (for details, see chapter 4.3.5) but I highlight the approach I prefer, according to which customers' judgements concerning the service quality (assessment of the perceived performance of the service provider) already include their expectations, meaning that customers implicitly insert their expectations in their value judgements. The decision support system gives decision-makers opportunity to assess the improvement of their service quality concerning a longer period. Taking advantage of the beneficial characteristic of the elaborated multidimensional model (opportunities given by the differently detailed data), decision-makers can get very useful information concerning quality improvement by comparing the single dimensions (subdimensions). Knowing the given company environment, the decision-maker can determine a starting threshold value in advance, according to his experiences to which the results of customer assessment can be compared. Further researches may aim to determine a base of comparison representing the average of the service quality of retailers pursuing activities that are similar from some point of view (for example: size, location etc.), in other words: an „industrial average” which also might be determined by the extensive application of the elaborated model of retail service quality.

Inserting DEA methodology (Data Envelopment Analysis)⁷² in the system is a further possibility. This could be applied mainly in the case of service providers which have more decision making units (more sites, for instance), or organizations operating in franchise system. By means of the DEA model and the processing and summarizing of certain performance indexes of the single units (outputs) and the data deriving from the retail service quality model (inputs), an ideal target can be determined. The single units could be assessed in comparison with this ideal target: units performing under it could be given directions related to service quality

⁷² For details concerning the DEA method, please see the works of de Lancer (1999) and Cooper et al. (2000).

improvement, while in case of units significantly exceeding it, resource-saving would be possible.

The decision support system must present the results to the decision-maker in an appropriate way in order to support quality improvement decisions. The outputs of the analyses can be graphical figures, tables that expressively show decision-makers the alternatives, improvement directions and the changes compared to the data of the preceding period, as well as the result of the alternative action chosen previously.

8.1.3. DEVELOPMENT AND IMPLEMENTATION

The essence of the decision support system for improvement of retail service quality is an internet-based application with determined functions and tasks. Input data are provided by the querying of customers (filling in a questionnaire) or through internet, while results can be accessed by managers through the company intranet (Figure No. 48).

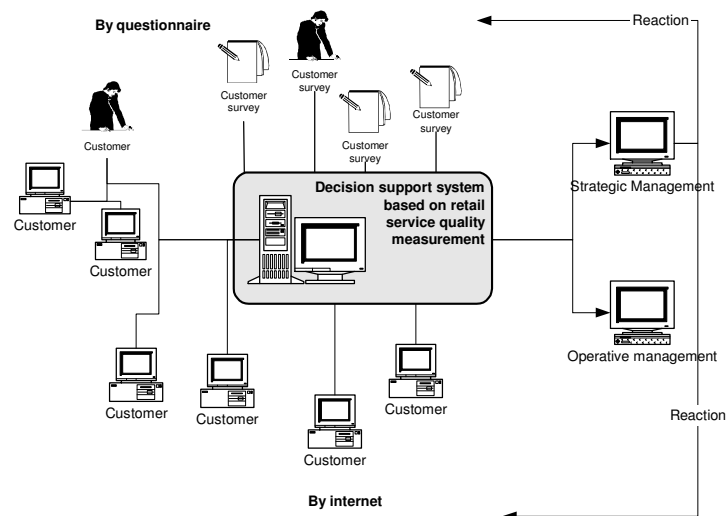


Figure No.48: Theoretical model of a decision support system for improving retail service quality

The interpretation and mathematical mapping of the retail service quality model functioning as central assessment method must be made available to the programmers actually improving the application. During the whole development period, the operation of the system must be refined and tested in cooperation with the programmers. In the *verification phase*, the full-scale operation of the functions

expected from the decision support system must be tested in order that it can be made available to the public as a market product.

After testing and verification, the system can be started in large. I expect it to become a stable, well usable decision support system suitable to the market, which gives assistance to managers.

8.2. ADVANTAGES AND DISADVANTAGES OF THE CONCEPTUAL DECISION SUPPORT SYSTEM, FURTHER TASKS

The development and application of the decision support system for improvement of retail service quality gives several tangible advantages to managers. First of all, it should be highlighted that, as far as I know, no similar system is available, which is probably owing the complexity and ambiguous interpretation of the task (measurement of service quality) primarily. However, the retail service quality scale improved and verified under domestic circumstances is suitable for the role of central model in the decision support system, thus the main obstacle preventing realization can perhaps be eliminated. Using the on-line system, decision-makers gain immediate access to the data related to service quality, which can be examined in various depths due to the structure of the system.

The system can facilitate dynamic surveys and observation of tendencies related to longer periods and thus, results of the installed steps of improvement can also be followed. The graphical, simple user interface ensures that the data can be interpreted almost at first sight and the results can be expressively presented. By use of the decision support system, decisions aiming at the improvement of retail service quality will be better established and more efficient, which will result in higher service quality, greater customer loyalty and, in the long-run, higher performance of the organization.

The greatest disadvantage of the decision support system lies in its specificity. Since the methodology of service quality measuring is sector-specific (in this case, it is related to retail service quality), also this system can be used in a given territory only. The diagnostic potency of the model is limited by the fact that at present, there are no basic data available which could facilitate the comparability of the results, thus the decision-maker should rely on his own experiences when determining the

appropriate level of service quality. One of the most important future tasks is to form a data base which collects results of the service provider having similar characteristics and, by evaluating these, functions as a base of comparison (as a „retail service quality standard”). On the other hand, the methodology of DEA (Data Envelopment Analysis) could also be integrated in the system in the future.

Further tasks are given. The decision support system for improvement of retail service quality must be worked out with assistance of programmers according to the outlined conceptual structure and, after the testing period, it must be introduced, facilitating managers of retail service providers to gain advantages and to be successful in the increasing competition by means of more efficient and better established decisions concerning quality improvement.

9. SUMMARY

Services play an increasingly important role both in global and national economy (Fitzsimmons and Fitzsimmons, 2004; ISO Survey 2005; EuroStat, 2007; Palánkai, 2007). Competition among service providers is increasing and it extends across borders and continents due to globalization. To be able to survive in the increasing competition, service providers should organize their operation according to the needs expressed (or in several cases even not expressed) by their customers. They should provide services and products meeting or even exceeding customer expectations: they should aim at quality. This applies to everyone in the service sector, to organizations providing social services (for example, educational or medical services), to personal services (hairdressers, for instance), to production services (for example, financial services) but most of all to distributive services and, within this sector, mainly to retail. In this service sector, reactions related to quality appear very quickly as a result of the close connection to customers, which affects organizations even more strongly due to the strong competition. Therefore, quality improvement is the prerequisite of survival and of profiting from competitive advantages. Retailers are mostly affected by competition and, most of all, they suffer from the lack of resources. They typically do not possess enough material, human or infrastructural resources to be able to make repeated attempts in the territory of improvement (quality improvement) safely, until an “action” proves to be successful. Therefore, it is absolutely necessary that retail service providers have access to ready, fully operational, verified and yet simple instruments in order to measure the service quality and determine the directions of quality improvement. The decision support system for improvement of retail service quality described in my dissertation and the retail service quality model serving as the central methodology thereof, can be such instruments.

The connection between quality and performance of the organization is not unambiguous. Numerous researchers (Buzzel and Gale, 1987; Fornell, 1992; Ittner and Larcker, 1998, Cronin et al., 2000; Dabholkar et al., 2000; Olorunniwo et al., 2006, for example) verified that higher service quality results in a higher performance of the organization, others however, proved the contrary (Grandzol and Gershon, 1997; Ittner, Larcker and Meyer, 2003). According to my survey

concerning Hungarian service provider organizations, I agree with the former statement. My hypothesis expecting a positive relation between service quality and performance of the organization is verified by the results of the research. It is proved that service organizations should care for quality and devote resources to the quality improvement, since it determines their performance and thus their position in competition. It can be stated that the improvement and later the application of the decision support system for improvement of retail service quality is of great importance from both theoretical and practical points of view.

The most important element of the improvement of the decision support system was the finding of the appropriate (retail) service quality measurement model. The SERVQUAL scale and the five service quality dimensions determined by it formed by Parasuraman et al. (1985, 1988, 1991a, 1991b, 1994a, 1994b) (the most often cited model in the related literature) seemed to be an appropriate model owing to its usability, extensive use and the extensive specialized literature. However, several researchers (Cronin and Taylor, 1992, 1994; Andersson, 1992; Teas, 1993, 1994; Brown, 1993; Spreng and Singh, 1993; Smith, 1995; Ausboteng, 1996; Buttle, 1996; Van Dyke et al., 1997; Coulthard, 2004) defined criticisms concerning the SERVQUAL method. The most important of these criticisms was the denial of its universal validity. My researches related to the appropriateness of the SERVQUAL scale verified this latter statement. The results of an empiric research based on the answers to the 22 statements of the SERVQUAL scale given by the customers of a Hungarian retail company (preliminary test, confirmative test) did not verify my expectation concerning jointing of the SERVQUAL dimensions under Hungarian circumstances of retail services. Accordingly, a new, appropriate retail service quality scale and measurement method had to be developed for the decision support system to be worked out.

I added elements derived from the thorough examination of the related literature to the view outlined by the results. I used the basics of SERVQUAL, the elements of the hierarchically structured retail scales of Dabholkar et al. (1996), Brady and Cronin (2001) as well as Sureshchandar et al.'s (2001) recommendations aiming at the acceptance of the social role of service providers. Accordingly, I expect the retail service quality model to be a multidimensional, hierarchic structure in which customers assess retail service quality through primary dimensions and

subdimensions related to them. Originally, the scale contained 27 statements in consideration of the deep interviews and the specialized literature, but later, as a result of scale cleaning, I removed three statements. In the long run, the conceptual scale is a structure consisting of 24 elements where customers assess the single statements in a graduation of 11 degree considering the perceived performance, thus the retail service quality derives from aggregation of the customer value judgements related to the single statements.

I assessed the dimensionality of the scale, namely the identifiable character and fit of the primary dimensions and subdimensions, as well as the hierarchical structure, the reliability and the validity of the scale through three independent researches (mobile phone retailer, tyre retailer, retailer of electronical goods). According to my preliminary expectations, four primary dimensions can be identified in the model: physical aspects, reliability, personal interactions and business policy, which can directly affect the customer assessment of retail service quality. Factor analyses, SEM analyses and examinations of reliability and validity proved the existence of the four primary dimensions and the presence of the retail service quality as secondary factor determined by the primary dimensions.

In the presumed model, I determined nine subdimensions, where physical aspects were determined by physical appearance and comfort elements, reliability was determined by promise and error-free services, personal interactions were determined by the employees' skills and problem solving and business policy was determined by the subdimensions of service-product, accessibility of services and social aspects. According to the factor analyses, SEM analyses, examinations of reliability and validity testing the structure, only the subdimensions of promise and error-free services could not be identified.

The preliminary expectation concerning the hierarchical structure of the model was verified by the analysis of the structural equation modeling. The four primary dimensions as secondary (latent) factors were identifiable to the seven subdimensions and the model proved that primary dimensions determine retail service quality as a secondary factor.

In the long run, the formed and verified retail service quality model (Figure No. 49) is a multidimensional structure, in which customers judge the retail service quality

through four primary dimensions (physical aspects, reliability, personal interactions, business policy) and the seven subdimensions related to them (physical appearance, comfort elements, employees' skills, problem solving, service-product, service accessibility, social aspects).

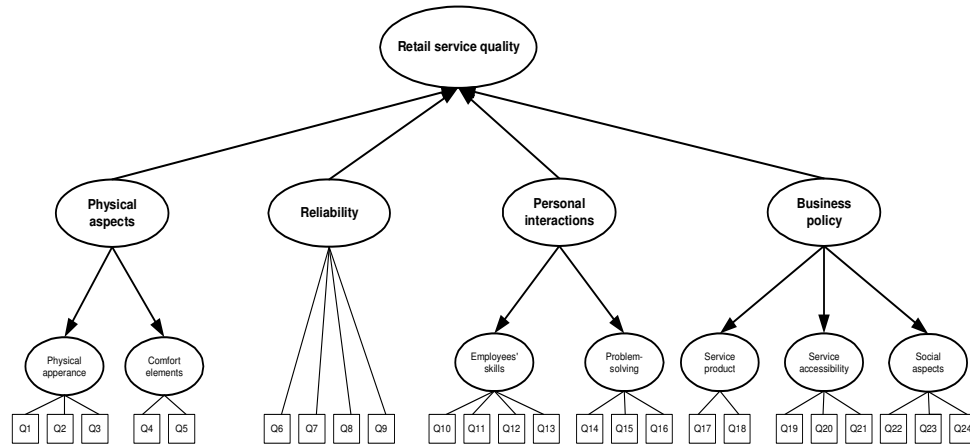


Figure No.49: Hierarchical model of retail service quality

The scale related to the model has 24 elements and it should be assessed according to the perception paradigm (considering only the perceived performance) in a scale of 11 degrees.

The novelty of the scale lies in the facts that it synthesizes several models and, most of all, includes previously unapplied characteristics and elements related to the social responsibility of the company, this way extending the interpretation of retail service quality corresponding to the challenges of our age. The hierarchic structure gives decision-makers further possibilities to analyse service quality in various depths (on overall level, on the level of primary dimensions or of subdimensions).

The elaborated retail service quality model fits in well with the basic concept of the service quality decision support system, due to its simple programmability, easy interpretability and use. According to the expectations concerning decision support systems, the model formed considering the steps of improvement defined in the Waterfall-model (Zoltay, 1994) is expected to be able to store and systematize the data concerning service quality in a data base, which are collected from customers by personal data collection or internet. Through its analytical module, the system must facilitate decision-makers to make comparisons dynamically on the level chosen by him (overall, primary dimension, subdimension) concerning previous basic data or „sectoral standards” appearing as objects for further researches. The

role of the graphical module lies in the presentation of results. It must present the directions and possibilities of improvement, helping decision-makers this way.

Retail service providers in the heavy competition have little possibility to break out due to lack of resources. Aiming at quality and the improvement of service quality can be a possibility for them, since service quality improvement plays an important role in increasing the performance of the company. The retail service quality measurement model elaborated and verified under domestic circumstances for the retail service producers can be instrumental in the realization of this aims both in theory and in practice. Managers can not only become aware of customers' value judgements concerning the service but they also get assistance in determination and formation of the directions of improvement by application of the decision support system to improve retail service quality, which was described in my dissertation. Due to the practical application of the system, established decisions of quality improvement will achieve their purposes, customers will be more satisfied and loyalty to the service producer as well as the willingness to buy again will increase, which will lead to a better result and a stable market position.

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APPENDIXES

Appendix 1.: Questionnaire (Research on service quality – organizational performance relationship)

Dear Madame/Sir!

I conduct a research on the relationship between **service quality** and **organizational performance**. Please support my research by filling in the questionnaire below.

Basic data:

Type of company: Bt: ☐ Kft: ☐ zRt: ☐ nyRt: ☐ Other: ☐

Number of employees: Below 5 ps: ☐ 5-10 ps: ☐ 10-50 ps: ☐ 50-100 ps: ☐ Above 100 ps: ☐

Annual turnover: Below 5 M Ft: ☐ 5-20 M Ft: ☐ 20-50 M Ft: ☐ 50-100 M Ft: ☐
100-500 M Ft: ☐ 500-1000 M Ft: ☐ Above 1000 M Ft: ☐

Scope of activity:

Does your company maintain some kind of Quality Management System?:

yes: ☐ no: ☐ , if yes, since when:

Does your company apply any computer aided management system, or decision support system?

yes: ☐ no: ☐ ,if yes, which one:.....

Questions on service quality:

Please rate your activity, service on the given 5 point scale by the statements below, where 1 means *wrong/low*, 5 means *excellent/very high*.

| No. | Statement | Score |
|-----|--------------------------------------------------------------------------------------------------------|-----------|
| 1 | The courtesy and friendliness of the employees. | 1 2 3 4 5 |
| 2 | The expertise and competency of the employees. | 1 2 3 4 5 |
| 3 | The overall knowledge of the employees in connection with the service procedures and business policy . | 1 2 3 4 5 |
| 4 | The reliability and helpfulness of the employees | 1 2 3 4 5 |
| 5 | Availability of employees for customers | 1 2 3 4 5 |
| 6 | The responsiveness of employees to customer requests | 1 2 3 4 5 |
| 7 | Efficiency of complaint handling | 1 2 3 4 5 |
| 8 | Fast account information (invoice administration speed) | 1 2 3 4 5 |
| 9 | Confidential treatment of client data, information and transactions | 1 2 3 4 5 |
| 10 | Process of handling customer complaints, standardization | 1 2 3 4 5 |
| 11 | Client contact management | 1 2 3 4 5 |
| 12 | Considering customer complaints in improving service quality. | 1 2 3 4 5 |

Questions on organizational performance:

Please rate your company's performance on the basis of the last 3 years' results. 1 means *reduced/poor*, 5 means *improved/excellent performance* on the 5 point scale.

| No. | Statement | Score |
|-----|-----------------------|-----------|
| 1 | Number of complaints | 1 2 3 4 5 |
| 2 | Return on investment | 1 2 3 4 5 |
| 3 | Financial performance | 1 2 3 4 5 |
| 4 | Sales growth | 1 2 3 4 5 |
| 5 | Productivity | 1 2 3 4 5 |
| 6 | Customer satisfaction | 1 2 3 4 5 |
| 7 | Employee satisfaction | 1 2 3 4 5 |

Thank you!

Appendix 2.: Main features of service quality models⁷³

| No. | Researcher (year) | Model | Weakness/limitation | Test audience | Method of datacollection | Scale | Method of analysis | Notes |
|------|-----------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| SQ1 | Grönroos (1984) | Technical and functional quality model | The model does not offer an explanation on how to measure functional and technical quality | Bank, insurance, restaurant, transport, airline companies, cleaning and maintenance, car rental, travel agencies, institutes from public sector | Survey questionnaire | 5-point Likert | Basic, statistical analysis | Basic model of service quality, most of the further models were based on it |
| SQ2 | U. Lehtinen, J.R. Lehtinen (1991) | Three dimension model | It was tested only in one sector. | Restaurants/ 33/60 respondents | Deep interview | - | Qualitive analysis, factor analysis | - |
| SQ3 | R.T. Rust, R.L. Oliver (1994) | Three component model | Theoretical model, empirically not proved. | - | - | - | - | It was used in practice for example: Commercial Bank (McDougall és Levesque, 1994), Health care (McAlexander, Kaldenberg és Koenig, 1994) |
| SQ4 | Parasuraman et al. (1985) | GAP model (SERVQUAL) | The model does not explain the clear measurement procedure for the measurement of gaps at different levels. Critiques of SERVQUAL, for example: definition of expectations, dimensionality, reliability, scale | Telephone co., securities brokerage, insurance, bank, repair and maintenance/ 298-487 respondents | Survey questionnaire | 7-point Likert | Principal axis factor followed by oblique rotation | The most widely used model, applied almost in every service sector. |
| SQ5 | Parasuraman et al. (1993) | Zone of Tolerance (ZOT) | Difficult to use because of the three different scales. | Insurance, repair and maintenance, leasing and rental of trucks, car repair, hotels/ 16 focus groups | Intreviews, group techniques | - | Focus group technique | In practice it was used by: Airline company (Chen, 1997), Financial services (Durvasula et al., 2005) |
| SQ6 | Hayword-Farmer (1988) | Attribute service quality model | Theoretical model, it does not offer a practical procedure capable of helping management to identify service quality problems or practical means of improving service quality | - | - | - | - | - |
| SQ7 | Brogowicz et al. (1990) | Synthesized model of service quality | Needs empirical validation. | - | - | - | - | - |
| SQ8 | Cronin, Taylor (1992) | SERVPERF | További szolgáltatási ágakban is igazolni kellene általános érvényességét. | Banking, Pest control, fast food, dry-cleaning/ 660 respondent | Survey questionnaire | 7-point semantic differential | Principal axis factor, oblique rotation, LISREL confirmatory analysis | A SERVQUAL kritikájára épülő modell, amelyet a gyakorlatban a SERVQUAL mellett a legtöbbször alkalmaznak. |
| SQ9 | Teas (1993) | Normed quality and evaluated performance model (EP, NQ) | This model was tested for limited sample size and for narrow service setting | Discount stores/ 120 respondent | Personal interview | - | Correlation analysis, t-test, qualitative assessment | - |
| SQ10 | Philip és Hazlett (1997) | PCP attribute model | The model is lacking in providing general dimensions to three levels of attributes. Lacks empirical validation. | - | - | - | - | - |
| SQ11 | Sweeney et al. (1997) | Retail service quality and perceived value model | The model considers only one value construct, i.e. value for money | Electronical appliances stores/ 1016 respondents | Survey questionnaire | 7 point semantic differential scale | Confirmatory factor analysis using LISREL | - |
| SQ12 | Bennington and Cummane (1998) | Customer value workshop (CVW) | Difficult, complex and long practical execution. Low reliability due to low samples. | 12-15 persons customer groups | Survey questionnaire, interviews, group techniques | - | Modified focus group technique | - |

⁷³ Source: N. Seth, S.G. Deshmuk, P. Vrat, (2005)

| No. | Researcher (year) | Model | Weakness/limitation | Test audience | Method of datacollection | Scale | Method of analysis | Notes |
|------|---------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------|----------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| SQ13 | Dabholkar et al. (1996) | Hierarchical retail service quality model | Dimensions defined for retail services. Model should be tested in other sectors. | Seven stores of two store-chains / 227 responses | Survey questionnaire | 5-point Likert | Confirmative factor analysis using LISREL, regression structural equation modeling | - |
| SQ14 | Brady és Cronin (2001) | Hierarchical model | Dimensions used in the model are not applicable in general. Model should be tested in other service sectors. | Fast-food, photography, amusement parks, cleaning services/ 1133 responses | Survey questionnaire | 7-point Likert | Confirmative factor analysis with LISREL, LISREL regression structural equation modeling | Similar hierarchical model offered by Gi-Du Kang (2006) - research on telephone companies |
| SQ15 | Dabholkar et al. (2000) | Antecedent mediator model | Antecedents of customer satisfaction have not been explored. Needs to be generalized for different service settings. | 397 undergraduate and postgraduate students | Telephonic interviews | - | LISREL regression structural equation modeling | - |
| SQ16 | Sureshchandar et al. (2001) | Critical factors of service quality | Theoretical model, not proved empirically. | - | - | - | - | - |
| SQ17 | Soteriou and Stavrinides (2000) | Internal service quality, DEA model | Applicability is limited. Does not provide the measurement of service quality. Needs other output data. | 26 bank branches/ 194 responses | Survey questionnaire | 7-point Likert | DEA (Data Envelopment Analysis) | In practice: Supermarket chain (Blose et al., 2005) Electronic supply services (Blose, Tankersly, 2004) |
| SQ18 | M.A. Robledo (2001) | SERVPEX | Model needs to be tested in other service sectors. | Three airline companies/ 1152 responses | Survey questionnaire | 7-point Likert | Confirmative factor analysis | - |

Appendix 3.: Expectation scale of SERVQUAL⁷⁴

| | Strongly disagree | | | | | | Strongly agree |
|---------------------------------------------------------------------------------------------------------------------|----------------------|---|---|---|---|---|-------------------|
| 1. They should have up-to-date equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Their physical facilities should be visually appealing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Their employees should be well dressed and appear neat. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The appearance of the physical facilities of these firms should be in keeping with the type of service provided. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. When these firms promises to do something by a certain time, they should do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. When customers have problems, these firms should be symphatetic and eassuring. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. These firms should be dependable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. They should provide their services at the time they promised to do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. They should keep their records accurately. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. They shouldn't be expected to tell customers exactly when services will be performed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. It is not realistic for customers to expect prompt service from employees of these firms. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Their employees don't always have to be willing to help customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. It is okay if they are too busy to respond to customers' requests promptly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Customers shpuld be able to trust employees of these firms. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Customers should be able to feel safe in their transactions with these firms' employees. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Their employees should be polite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Their employees should get adequate support from these firms to do their jobs well. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. These firms should not be expected to give customers individual attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Employees of these firms cannot be expected to give customers personal attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. It is unrealistic to expect employees to know what the needs of their customers are. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. It is unrealistic to expect these firms to have their customers' best interest at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. They shouldn't be expected to have operating hours convenient to all their customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

⁷⁴ Source: Parasuraman et al. (1988).

Appendix 4.: Perception scale of SERVQUAL⁷⁵

| | Strongly disagree | | | | | | Strongly agree |
|------------------------------------------------------------------------------------------------------|----------------------|---|---|---|---|---|-------------------|
| 1. XYZ has up-to-date equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. XYZ's physical facilities should be visually appealing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. XYZ's employees should be well dressed and appear neat. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The appearance of the physical facilities of XYZ is in keeping with the type of service provided. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. When XYZ promises to do something by a certain time, they should do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. When you have problems, XYZ is symphatetic and eassuring. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. XYZ is dependable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. XYZ provides its services at the time it promises to do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. XYZ keeps its records accurately. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. XYZ does not tell tell customers exactly when services will be performed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. You do not receive prompt service from XYZ's employees. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Employees of XYZ are not always willing to help customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Employees of XYZ are too busy to respond to customers' requests promptly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. You can trust employees of XYZ. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. You feel safe in your transactions with XYZ's employees. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Employees of XYZ are polite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Employees get adequate support from XYZ to do their jobs well. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. XYZ does not give you individual attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Employees of XYZ do not give you personal attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Employees of XYZ do not know what your needs are. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. XYZ does not have your best interest at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. XYZ does not have operating hours convenient to all their customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

⁷⁵ Source: Parasuraman et al. (1988).

Appendix 5.: Modified SERVQUAL scale applied in the pilot-study

| | Strongly disagree | | | | | | Strongly agree |
|----------------------------------------------------------------------------|----------------------|---|---|---|---|---|-------------------|
| 1. XYZ Co. Has modern-looking equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. XYZ Co.'s physical facilities visually appealing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. XYZ Co.'s employees are neat-appearing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Materials associated with the service are visually appealing at XYZ Co. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. When XYZ Co. promises to do something by a certain time, it does so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. When you have problem, XYZ Co. shows a sincere interest in solving it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. XYZ Co. performs the service right the first time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. XYZ Co. provides its services at the time it promises to do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. XYZ Co. insists on error-free records. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Employees of XYZ Co. tell you exactly when services will be performed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Employees of XYZ Co. give you prompt service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Employees of XYZ Co. are always willing to help you. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Employees of XYZ Co. are never too busy to respond to your requests. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. The behavior of employees of XYZ Co. instills confidence in you. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. You feel safe in your transactions with XYZ Co. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Employees of XYZ Co. are consistently courteous with you. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Employees of XYZ Co. have the knowledge to answer your questions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. XYZ Co. Gives you individual attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. XYZ Co. Has operating hours convenient to all its customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. XYZ Co. Has employees who give you personal attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. XYZ Co. Has your best interest at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Employees of XYZ Co. undersatnd your specific needs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix 6.: Tables of principal component analysis – pilot-study, first variable group (VAR01-VAR04)

Correlation matrix

| | | VAR01 | VAR02 | VAR03 | VAR04 |
|-------------|-------|--------|-------|-------|--------|
| Correlation | VAR01 | 1,000 | 0,738 | 0,096 | -0,017 |
| | VAR02 | 0,738 | 1,000 | 0,217 | 0,035 |
| | VAR03 | 0,096 | 0,217 | 1,000 | 0,519 |
| | VAR04 | -0,017 | 0,035 | 0,519 | 1,000 |

Anti-image matrix

| | | VAR01 | VAR02 | VAR03 | VAR04 |
|------------------------|-------|--------------------|--------------------|--------------------|--------------------|
| Anti-image covariance | VAR01 | 0,451 | -0,325 | 4,160E-02 | 8,904E-03 |
| | VAR02 | -0,325 | 0,433 | -0,116 | 2,875E-02 |
| | VAR03 | 4,160E-02 | -0,116 | 0,687 | -0,368 |
| | VAR04 | 8,904E-03 | 2,875E-02 | -0,368 | 0,724 |
| Anti-image correlation | VAR01 | 0,503 ^a | -0,736 | 7,473E-02 | 1,558E-02 |
| | VAR02 | -0,736 | 0,501 ^a | -0,212 | 5,135E-02 |
| | VAR03 | 7,473E-02 | -0,212 | 0,502 ^a | -0,522 |
| | VAR04 | 1,558E-02 | 5,135E-02 | -0,522 | 0,496 ^a |

^a: Measures of Sampling Adequacy(MSA)

KMO and Bartlett's tests

| | | |
|-------------------------------------------------|--------------------|--------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0,501 |
| Bartlett's test of sphericity | Approx. Chi-square | 42,982 |
| | Df | 6 |
| | Sig. | 0,000 |

Communalities

| | Initial | Extraction |
|-------|---------|------------|
| VAR01 | 1,000 | 0,866 |
| VAR02 | 1,000 | 0,872 |
| VAR03 | 1,000 | 0,766 |
| VAR04 | 1,000 | 0,776 |

Note: Principal component analysis

Total variance explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1,840 | 46,006 | 46,006 | 1,840 | 46,006 | 46,006 |
| 2 | 1,440 | 36,003 | 82,009 | 1,440 | 36,003 | 82,009 |
| 3 | 0,469 | 11,733 | 93,742 | | | |
| 4 | 0,250 | 6,258 | 100,000 | | | |

Note: Principal component analysis

Component Matrix

| | Component | |
|-------|--------------|-------|
| | 1 | 2 |
| VAR02 | 0,872 | |
| VAR01 | 0,820 | |
| VAR04 | | 0,808 |
| VAR03 | | 0,693 |

Note: Principal component analysis

Appendix 7.: Tables of principal component analysis – pilot-study, second variable group (VAR05-VAR09)

Correlation matrix

| | | VAR05 | VAR06 | VAR07 | VAR08 | VAR09 |
|-------------|-------|-------|-------|-------|-------|-------|
| Correlation | VAR05 | 1,000 | 0,588 | 0,276 | 0,679 | 0,169 |
| | VAR06 | 0,588 | 1,000 | 0,357 | 0,527 | 0,524 |
| | VAR07 | 0,276 | 0,357 | 1,000 | 0,334 | 0,361 |
| | VAR08 | 0,679 | 0,527 | 0,334 | 1,000 | 0,290 |
| | VAR09 | 0,169 | 0,524 | 0,361 | 0,290 | 1,000 |

Anti-image matrix

| | | VAR05 | VAR06 | VAR07 | VAR08 | VAR09 |
|------------------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Anti-image covariance | VAR05 | 0,435 | -0,193 | -2,569E-02 | -0,251 | 0,135 |
| | VAR06 | -0,193 | 0,460 | -4,790E-02 | -4,420E-02 | -0,259 |
| | VAR07 | -2,569E-02 | -4,790E-02 | 0,801 | -8,267E-02 | -0,160 |
| | VAR08 | -0,251 | -4,420E-02 | -8,267E-02 | 0,493 | -6,746E-02 |
| | VAR09 | 0,135 | -0,259 | -0,160 | -6,746E-02 | 0,646 |
| Anti-image correlation | VAR05 | 0,626 ^a | -0,431 | -4,351E-02 | -0,541 | 0,254 |
| | VAR06 | -0,431 | 0,706 ^a | -7,887E-02 | -9,274E-02 | -0,475 |
| | VAR07 | -4,351E-02 | -7,887E-02 | 0,856 ^a | -0,131 | -0,222 |
| | VAR08 | -0,541 | -9,274E-02 | -0,131 | 0,737 ^a | -0,120 |
| | VAR09 | 0,254 | -0,475 | -0,222 | -0,120 | 0,593 ^a |

^a Measures of Sampling Adequacy (MSA)

KMO és Bartlett's test

| | |
|-------------------------------------------------|------------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | 0,689 |
| Approx. Chi-square | 61,989 |
| Bartlett's test of Sphericity | df 10 |
| | Sig. 0,000 |

Communalities (One and Two components)

| | Initial | Extraction (1 comp.) | Extraction (2 comp.) |
|-------|---------|----------------------|----------------------|
| VAR05 | 1,000 | 0,605 | 0,864 |
| VAR06 | 1,000 | 0,706 | 0,703 |
| VAR07 | 1,000 | 0,356 | 0,528 |
| VAR08 | 1,000 | 0,643 | 0,771 |
| VAR09 | 1,000 | 0,369 | 0,786 |

Note: Principal component analysis

Total Variance Explained (One and two components)

| Component | Initial eigenvalues | | | Extraction Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2,679 | 53,582 | 53,582 | 2,679 | 53,582 | 53,582 |
| 2 | 0,979 | 19,580 | 73,162 | 0,979 | 19,580 | 73,162 |
| 3 | 0,689 | 13,778 | 86,939 | | | |
| 4 | 0,400 | 7,991 | 94,931 | | | |
| 5 | 0,253 | 5,069 | 100,000 | | | |

Note: Principal component analysis

Component matrix (One and two components)

| | Component | | Component | | | Rotated component matrix | |
|-------|-----------|-------|-----------|--------|-------|--------------------------|-------|
| | 1 | | 1 | 2 | | 1 | 2 |
| VAR06 | 0,840 | VAR05 | 0,840 | | VAR05 | 0,926 | |
| VAR08 | 0,802 | VAR08 | 0,802 | -0,358 | VAR08 | 0,851 | |
| VAR05 | 0,778 | VAR06 | 0,778 | -0,508 | VAR06 | 0,628 | 0,561 |
| VAR09 | 0,607 | VAR09 | 0,597 | | VAR09 | | 0,884 |
| VAR07 | 0,597 | VAR07 | 0,607 | 0,646 | VAR07 | | 0,695 |

Note: Principal component analysis, rotation: Varimax with Kaiser Normalization (3 iterations)

Appendix 8.: Tables of principal component analysis – pilot-study, third variable group (VAR10-VAR13)

Correlation matrix

| | | VAR10 | VAR11 | VAR12 | VAR13 |
|--------------------|--------------|-------|-------|-------|-------|
| Correlation | VAR10 | 1,000 | 0,396 | 0,380 | 0,563 |
| | VAR11 | 0,396 | 1,000 | 0,451 | 0,201 |
| | VAR12 | 0,380 | 0,451 | 1,000 | 0,416 |
| | VAR13 | 0,563 | 0,201 | 0,416 | 1,000 |

Anti-image matrix

| | | VAR10 | VAR11 | VAR12 | VAR13 |
|-------------------------------|--------------|--------------------|--------------------|--------------------|--------------------|
| Anti-image covariance | VAR10 | 0,598 | -0,198 | -3,718E-02 | -0,303 |
| | VAR11 | -0,198 | 0,724 | -0,264 | 9,096E-02 |
| | VAR12 | -3,718E-02 | -0,264 | 0,684 | -0,192 |
| | VAR13 | -0,303 | 9,096E-02 | -0,192 | 0,624 |
| Anti-image correlation | VAR10 | 0,645 ^a | -0,301 | -5,813E-02 | -0,495 |
| | VAR11 | -0,301 | 0,616 ^a | -0,375 | 0,135 |
| | VAR12 | -5,813E-02 | -0,375 | 0,693 ^a | -0,294 |
| | VAR13 | -0,495 | 0,135 | -0,294 | 0,602 ^a |

^a Measures of Sampling Adequacy (MSA)

KMO és Bartlett's test

| | | |
|--------------------------------------------------------|--------------------|--------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0,639 |
| Bartlett's test of Sphericity | Approx. Chi-square | 34,320 |
| | Df | 6 |
| | Sig. | 0,000 |

Communalities (One and two components)

| | Initial | Extraction (1 comp.) | Extraction (2 comp.) |
|--------------|--------------|----------------------|----------------------|
| VAR10 | 1,000 | 0,641 | 0,711 |
| VAR11 | 1,000 | 0,445 | 0,854 |
| VAR12 | 1,000 | 0,571 | 0,636 |
| VAR13 | 1,000 | 0,552 | 0,852 |

Note: Principal Component Analysis

Total Variance Explained (One, and two components)

| Components | Initial eigenvalue | | | Extraction Sums of Squared Loadings | | |
|------------|--------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2,210 | 55,250 | 55,250 | 2,679 | 55,250 | 55,250 |
| 2 | 0,843 | 21,087 | 76,337 | 0,843 | 21,087 | 76,337 |
| 3 | 0,586 | 14,647 | 90,984 | | | |
| 4 | 0,361 | 9,016 | 100,000 | | | |

Note: Principal Component Analysis

Component Matrix (One and two components)

| | Component | | Component | | Rotated component matrix | | |
|--------------|--------------|--------------|--------------|--------|--------------------------|--------------|-------|
| | 1 | | 1 | 2 | 1 | 2 | |
| VAR10 | 0,801 | VAR10 | 0,801 | | VAR10 | 0,919 | |
| VAR12 | 0,756 | VAR12 | 0,756 | | VAR12 | 0,774 | |
| VAR13 | 0,743 | VAR13 | 0,743 | -0,548 | VAR13 | | 0,921 |
| VAR11 | 0,667 | VAR11 | 0,667 | 0,639 | VAR11 | 0,395 | 0,693 |

Note: Principal Component Analysis, Rotation: Varimax with Kaiser Normalization (3 iterations)

Appendix 9.: Tables of principal component analysis – pilot-study, fourth variable group (VAR14-VAR17)

Correlation matrix

| | | VAR14 | VAR15 | VAR16 | VAR17 |
|-------------|-------|-------|-------|-------|-------|
| Correlation | VAR14 | 1,000 | 0,705 | 0,772 | 0,758 |
| | VAR15 | 0,705 | 1,000 | 0,717 | 0,714 |
| | VAR16 | 0,772 | 0,717 | 1,000 | 0,655 |
| | VAR17 | 0,758 | 0,714 | 0,655 | 1,000 |

Anti-image matrix

| | | VAR14 | VAR15 | VAR16 | VAR17 |
|------------------------|-------|--------------------|--------------------|--------------------|--------------------|
| Anti-image covariance | VAR14 | 0,288 | -4,291E-02 | -0,149 | -0,142 |
| | VAR15 | -4,291E-02 | 0,375 | -0,126 | -0,131 |
| | VAR16 | -0,149 | -0,126 | 0,344 | -8,451E-03 |
| | VAR17 | -0,142 | -0,131 | -8,451E-03 | 0,361 |
| Anti-image correlation | VAR14 | 0,793 ^a | -0,131 | -0,474 | -0,440 |
| | VAR15 | -0,131 | 0,851 ^a | -0,350 | -0,355 |
| | VAR16 | -0,474 | -0,350 | 0,816 ^a | -2,395E-02 |
| | VAR17 | -0,440 | -0,355 | -2,395E-02 | 0,825 ^a |

a Measures of Sampling Adequacy (MSA)

KMO és Bartlett's test

| | | |
|-------------------------------------------------|------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0,820 |
| Approx. Chi-square | | 102,037 |
| Bartlett's test of Sphericity | Df | 6 |
| | Sig. | 0,000 |

Communalities

| | Initial | Extraction |
|-------|---------|------------|
| VAR14 | 1,000 | 0,831 |
| VAR15 | 1,000 | 0,776 |
| VAR16 | 1,000 | 0,782 |
| VAR17 | 1,000 | 0,772 |

Note: Principal Component Analysis

Total Variance Explained

| Component | Initial Eigenvalue | | | Extraction Sums of Squared Loadings | | |
|-----------|--------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3,161 | 79,028 | 79,028 | 3,161 | 79,028 | 79,028 |
| 2 | 0,345 | 8,636 | 87,664 | | | |
| 3 | 0,306 | 7,648 | 95,312 | | | |
| 4 | 0,188 | 4,688 | 100,000 | | | |

Note: Principal Component Analysis

Component Matrix

| | Component |
|-------|-----------|
| | 1 |
| VAR14 | 0,911 |
| VAR17 | 0,884 |
| VAR16 | 0,881 |
| VAR15 | 0,879 |

Note: Principal Component Analysis

Appendix 10.: Tables of principal component analysis – pilot-study, fifth variable group (VAR18-VAR22)

Correlation Matrix

| | | VAR18 | VAR19 | VAR20 | VAR21 | VAR22 |
|-------------|-------|-------|-------|-------|-------|-------|
| Correlation | VAR18 | 1,000 | 0,274 | 0,676 | 0,648 | 0,753 |
| | VAR19 | 0,274 | 1,000 | 0,293 | 0,378 | 0,217 |
| | VAR20 | 0,676 | 0,293 | 1,000 | 0,587 | 0,578 |
| | VAR21 | 0,648 | 0,378 | 0,587 | 1,000 | 0,785 |
| | VAR22 | 0,753 | 0,217 | 0,578 | 0,785 | 1,000 |

Anti-image matrix

| | | VAR18 | VAR19 | VAR20 | VAR21 | VAR22 |
|------------------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Anti-image covariance | VAR18 | 0,343 | -4,577E-02 | -0,175 | 1,419E-03 | -0,147 |
| | VAR19 | -4,577E-02 | 0,820 | -5,299E-02 | -0,157 | 8,760E-02 |
| | VAR20 | -0,175 | -5,299E-02 | 0,500 | -7,739E-02 | 2,045E-03 |
| | VAR21 | 1,419E-03 | -0,157 | -7,739E-02 | 0,324 | -0,178 |
| | VAR22 | -0,147 | 8,760E-02 | 2,045E-03 | -0,178 | 0,271 |
| Anti-image correlation | VAR18 | 0,784 ^a | -8,636E-02 | -0,422 | 4,258E-03 | -0,483 |
| | VAR19 | -8,636E-02 | 0,714 ^a | -8,271E-02 | -0,303 | 0,186 |
| | VAR20 | -0,422 | -8,271E-02 | 0,846 ^a | -0,192 | 5,551E-03 |
| | VAR21 | 4,258E-03 | -0,303 | -0,192 | 0,757 ^a | -0,601 |
| | VAR22 | -0,483 | 0,186 | 5,551E-03 | -0,601 | 0,713 ^a |

^a Measures of Sampling Adequacy(MSA)

KMO és Bartlett's test

| | |
|-------------------------------------------------|------------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | 0,765 |
| Approx. Chi-square | 98,438 |
| Bartlett's test of Sphericity | Df 10 |
| | Sig. 0,000 |

Communalities (one and two components)

| | Initial | Extraction (1 comp.) | Extraction (2 comp.) |
|-------|---------|----------------------|----------------------|
| VAR18 | 1,000 | 0,767 | 0,796 |
| VAR19 | 1,000 | 0,211 | 0,991 |
| VAR20 | 1,000 | 0,650 | 0,653 |
| VAR21 | 1,000 | 0,769 | 0,769 |
| VAR22 | 1,000 | 0,776 | 0,833 |

Note: Principal Component Analysis

Total Variance Explained (One and two components)

| Component | Initial Eigenvalue | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|--------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3,173 | 63,450 | 63,450 | 3,173 | 63,450 | 63,450 | 2,947 | 58,933 | 58,933 |
| 2 | 0,869 | 17,387 | 80,837 | 0,869 | 17,387 | 80,837 | 1,095 | 21,904 | 80,837 |
| 3 | 0,487 | 9,731 | 90,568 | | | | | | |
| 4 | 0,309 | 6,181 | 96,749 | | | | | | |
| 5 | 0,163 | 3,251 | 100,000 | | | | | | |

Note: Principal Component Analysis

Component matrix (One and two components)

| | Component | | | Rotated component matrix | | |
|-------|-----------|-------|-------|--------------------------|-------|-------|
| | 1 | | 2 | 1 | | 2 |
| VAR22 | 0,881 | VAR22 | 0,881 | -0,239 | VAR22 | 0,911 |
| VAR18 | 0,877 | VAR18 | 0,877 | | VAR18 | 0,885 |
| VAR21 | 0,876 | VAR21 | 0,876 | | VAR21 | 0,832 |
| VAR20 | 0,806 | VAR20 | 0,806 | | VAR20 | 0,785 |
| VAR19 | 0,460 | VAR19 | 0,460 | 0,883 | VAR19 | 0,983 |

Principal Component Analysis, Rotation: Varimax with Kaiser Normalization (3 iterations)

Appendix 11.: Questionnaire applied in „confirmative” research

Dear Customer!

Our company's goal to provide high level service to our customers. Please, contribute to our company's service quality improvement efforts by rating the statements below (**1 – strongly disagree; 7 – strongly agree**).

Sex of respondent: female: ☐ male: ☐

Age of respondent: below 20 ys: ☐ 20-30 ys: ☐ 31-40 ys: ☐ 41-50 ys: ☐ 51-60 ys: ☐ Above 61 ys: ☐

Qualification of respondent: elementary school: ☐ high school: ☐ university: ☐

| No. | Statement | Strongly disagree | Score | | | | | | | Strongly agree |
|-----|-------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------|
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 1 | XYZ Co. has modern-looking equipment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2 | XYZ Co.'s physical facilities visually appealing. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3 | XYZ Co.'s employees are neat-appearing. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4 | Materials associated with the service are visually appealing at XYZ Co. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5 | When XYZ Co. promises to do something by a certain time, it does so. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 6 | When you have problem, XYZ Co. shows a sincere interest in solving it. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7 | XYZ Co. performs the service right the first time. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8 | XYZ Co. provides its services at the time it promises to do so. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 9 | XYZ Co. insists on error-free records. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 10 | Employees in XYZ Co. tell you exactly when services will be performed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 11 | Employees in XYZ Co. give you prompt service. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 12 | Employees in XYZ Co. are always willing to help you. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 13 | Employees in XYZ Co. are never too busy to respond to your requests. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 14 | The behavior of employees in XYZ Co. instills confidence in you. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 15 | You feel safe in your transactions with XYZ Co. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 16 | Employees in XYZ Co. are consistently courteous with you. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 17 | Employees in XYZ Co. have the knowledge to answer your questions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 18 | XYZ Co. gives you individual attention. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 19 | XYZ Co. Has operating hours convenient to all its customers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 20 | XYZ Co. Has employees who give you personal attention. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 21 | XYZ Co. Has your best interest at heart. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 22 | Employees of XYZ Co. understand your specific needs. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Thank you.

Appendix 12.: Tables of principal component analysis – confirmative research on SERVQUAL’s dimensionality

KMO és Bartlett’s test

| | | |
|-------------------------------------------------|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0,893 |
| Bartlett’s test | Approx. Chi-square | 2556,704 |
| | Df | 231 |
| | Sig. | 0,000 |

Communalities (Four components)

| | Initial | Extraction |
|-------|---------|------------|
| VAR01 | 1,000 | 0,693 |
| VAR02 | 1,000 | 0,783 |
| VAR03 | 1,000 | 0,536 |
| VAR04 | 1,000 | 0,433 |
| VAR05 | 1,000 | 0,793 |
| VAR06 | 1,000 | 0,857 |
| VAR07 | 1,000 | 0,559 |
| VAR08 | 1,000 | 0,837 |
| VAR09 | 1,000 | 0,624 |
| VAR10 | 1,000 | 0,639 |
| VAR11 | 1,000 | 0,678 |
| VAR12 | 1,000 | 0,721 |
| VAR13 | 1,000 | 0,506 |
| VAR14 | 1,000 | 0,650 |
| VAR15 | 1,000 | 0,571 |
| VAR16 | 1,000 | 0,718 |
| VAR17 | 1,000 | 0,713 |
| VAR18 | 1,000 | 0,645 |
| VAR19 | 1,000 | 0,811 |
| VAR20 | 1,000 | 0,658 |
| VAR21 | 1,000 | 0,738 |
| VAR22 | 1,000 | 0,462 |

Note: Principal Component Analysis

Total Variance Explained (Four and five components)

| Component | Initial Eigenvalue | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|--------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 10,565 | 48,025 | 48,025 | 10,565 | 48,025 | 48,025 | 7,250 | 32,953 | 32,953 |
| 2 | 1,667 | 7,578 | 55,603 | 1,667 | 7,578 | 55,603 | 3,720 | 16,908 | 49,860 |
| 3 | 1,375 | 6,251 | 61,854 | 1,375 | 6,251 | 61,854 | 2,207 | 10,034 | 59,894 |
| 4 | 1,016 | 4,619 | 66,473 | 1,016 | 4,619 | 66,473 | 1,447 | 6,579 | 66,473 |
| 5 | 0,913 | 4,149 | 70,622 | 0,913 | 4,149 | 70,622 | 1,186 | 5,392 | 70,622 |
| 6 | 0,789 | 3,584 | 74,206 | | | | | | |
| 7 | 0,746 | 3,390 | 77,597 | | | | | | |
| 8 | 0,695 | 3,159 | 80,755 | | | | | | |
| 9 | 0,577 | 2,623 | 83,379 | | | | | | |
| 10 | 0,497 | 2,258 | 85,637 | | | | | | |
| 11 | 0,456 | 2,073 | 87,710 | | | | | | |
| 12 | 0,407 | 1,849 | 89,559 | | | | | | |
| 13 | 0,394 | 1,793 | 91,352 | | | | | | |
| 14 | 0,335 | 1,521 | 92,872 | | | | | | |
| 15 | 0,301 | 1,367 | 94,239 | | | | | | |
| 16 | 0,286 | 1,299 | 95,538 | | | | | | |
| 17 | 0,266 | 1,209 | 96,747 | | | | | | |
| 18 | 0,225 | 1,024 | 97,771 | | | | | | |
| 19 | 0,161 | 0,733 | 98,504 | | | | | | |
| 20 | 0,155 | 0,704 | 99,208 | | | | | | |
| 21 | 0,104 | 0,473 | 99,681 | | | | | | |
| 22 | 7,019E-02 | 0,319 | 100,000 | | | | | | |

Note: Principal Component Analysis, Rotation: Varimax with Kaiser Normalization

Appendix 13.: Thresholds of fit indices applied in confirmative factor analysis⁷⁶

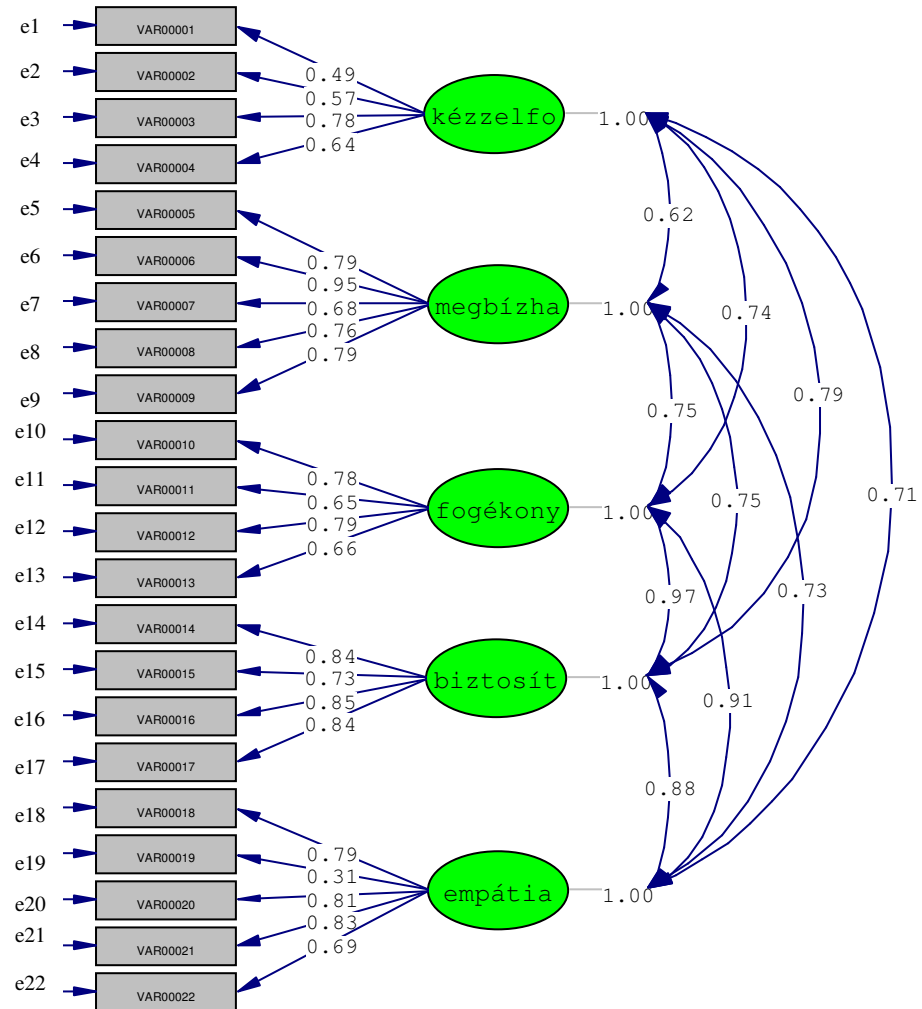
| Criterion | Threshold |
|-------------------------------------------------------------------|-------------|
| Chi-square (χ^2) | >0,05 |
| Chi-square/degree of freedom (χ^2/df) ⁷⁷ | ≤ 5 |
| GFI (Goodness of Fit Index) | $\geq 0,9$ |
| AGFI (Adjusted Goodness of Fit Index) | $\geq 0,8$ |
| RMR (Root Mean Square Residual) | $\leq 0,10$ |
| RMSEA (Root Mean Square Error of Approximation) ⁷⁸ | $\leq 0,08$ |
| NFI (Normed Fit Index) | $\geq 0,90$ |
| CFI (Comparative Fit Index) | $\geq 0,90$ |
| Cronbach α | >0,70 |
| Variance explained | >0,50 |

⁷⁶ Source: Sajtos, 2004, p. 223.; Hair et al., 1998.

⁷⁷ Value should be less than 5 by Wheaton et al. (1977)

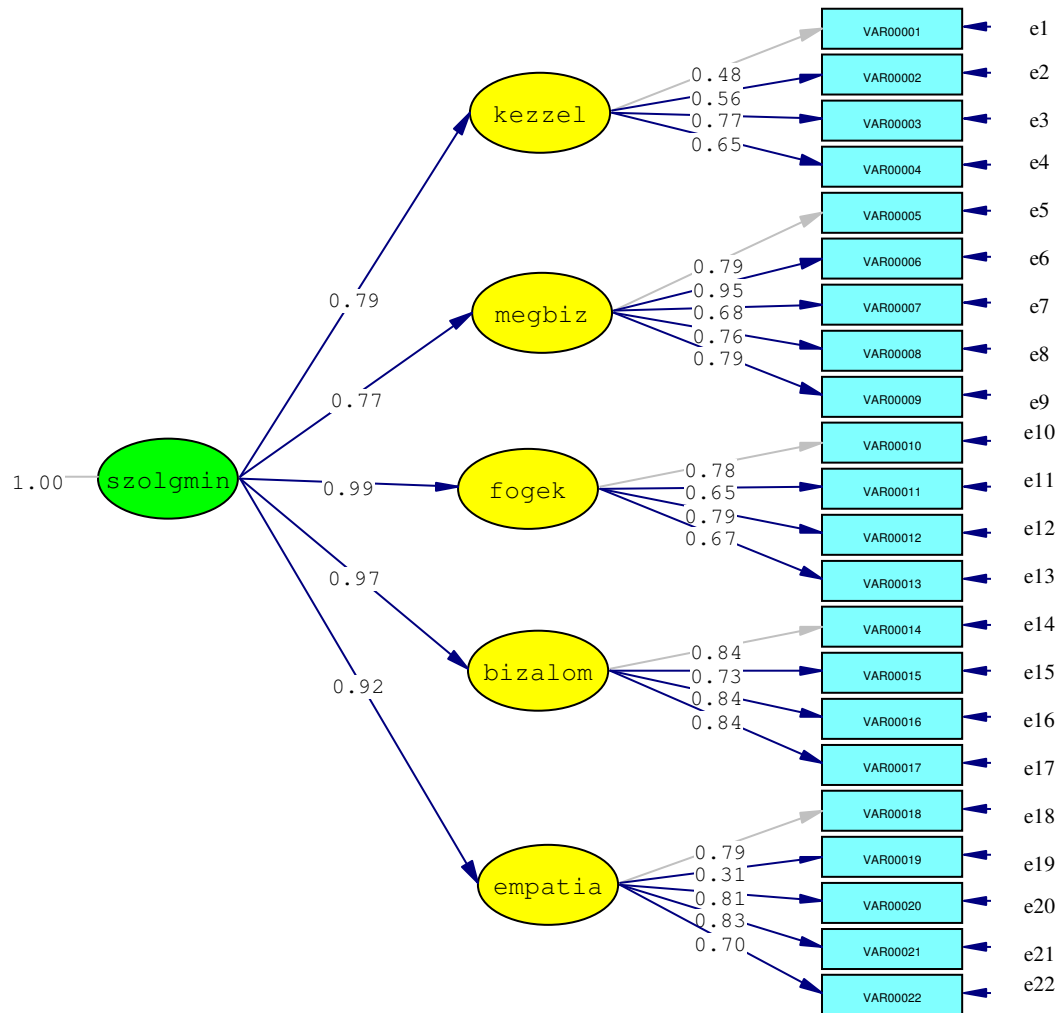
⁷⁸ Square Error between observed and estimated covariance matrices.

Appendix 14.: First order SEM (standardized regression coefficients) – „confirmative”-study on SERVQUAL’s dimensionality⁷⁹



⁷⁹ Kezzelfo = tangibles; megbízha = reliability; fogékony = responsiveness; biztosít = assurance; empátia = empathy

Appendix 15.: Second order SEM (standardized regression coefficients) – „confirmative”-study on SERVQUAL’s dimensionality⁸⁰



Chi-Square=572.40, df=204, P-value=0.00000, RMSEA=0.106

⁸⁰ szolgmin = service quality; kezzel = tangibles; megbiz = reliability; fogek = responsiveness; bizalom = assurance; empatia = empathy

Appendix 16.: Correlation matrix – „confirmative”-study on SERVQUAL’s dimensionality⁸¹

| | | VAR01 | VAR02 | VAR03 | VAR04 | VAR05 | VAR06 | VAR07 | VAR08 | VAR09 | VAR10 | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 | VAR21 | VAR22 |
|--------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|
| Correlation | VAR01 | 1,000 | ,601 | ,295 | ,206 | ,363 | ,270 | ,285 | ,323 | ,278 | ,284 | ,027 | ,261 | ,361 | ,378 | ,332 | ,299 | ,306 | ,303 | ,061 | ,250 | ,267 | ,227 |
| | VAR02 | ,000 | 1,000 | ,458 | ,305 | ,234 | ,290 | ,290 | ,260 | ,307 | ,234 | ,005 | ,198 | ,291 | ,291 | ,334 | ,319 | ,275 | ,301 | ,097 | ,209 | ,280 | ,147 |
| Sig. (1.tailed) | VAR03 | ,000 | ,000 | 1,000 | ,512 | ,388 | ,417 | ,374 | ,301 | ,408 | ,408 | ,426 | ,471 | ,373 | ,478 | ,463 | ,597 | ,538 | ,467 | ,217 | ,448 | ,474 | ,353 |
| | VAR04 | ,004 | ,000 | ,000 | 1,000 | ,354 | ,424 | ,414 | ,260 | ,414 | ,451 | ,424 | ,498 | ,445 | ,340 | ,404 | ,475 | ,476 | ,484 | ,172 | ,368 | ,439 | ,319 |
| | VAR05 | ,000 | ,001 | ,000 | ,000 | 1,000 | ,757 | ,493 | ,792 | ,508 | ,439 | ,263 | ,392 | ,439 | ,515 | ,445 | ,478 | ,505 | ,470 | ,164 | ,378 | ,495 | ,381 |
| | VAR06 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,632 | ,726 | ,767 | ,634 | ,499 | ,534 | ,377 | ,548 | ,563 | ,555 | ,608 | ,618 | ,160 | ,570 | ,543 | ,468 |
| | VAR07 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,446 | ,599 | ,634 | ,375 | ,488 | ,473 | ,588 | ,405 | ,518 | ,589 | ,627 | ,152 | ,465 | ,532 | ,418 |
| | VAR08 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,518 | ,341 | ,172 | ,316 | ,381 | ,435 | ,358 | ,347 | ,454 | ,324 | ,039 | ,353 | ,326 | ,347 |
| | VAR09 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,585 | ,423 | ,549 | ,386 | ,552 | ,516 | ,486 | ,623 | ,531 | ,141 | ,511 | ,492 | ,361 |
| | VAR10 | ,000 | ,001 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,497 | ,523 | ,624 | ,561 | ,549 | ,594 | ,670 | ,684 | ,227 | ,601 | ,633 | ,482 |
| | VAR11 | ,365 | ,477 | ,000 | ,000 | ,000 | ,000 | ,000 | ,014 | ,000 | ,000 | 1,000 | ,668 | ,301 | ,472 | ,498 | ,523 | ,559 | ,430 | ,187 | ,524 | ,385 | ,395 |
| | VAR12 | ,000 | ,006 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,522 | ,654 | ,560 | ,674 | ,657 | ,615 | ,151 | ,556 | ,572 | ,489 |
| | VAR13 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,514 | ,587 | ,558 | ,521 | ,549 | ,161 | ,428 | ,443 | ,393 |
| | VAR14 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,595 | ,764 | ,734 | ,610 | ,214 | ,563 | ,595 | ,499 |
| | VAR15 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,603 | ,597 | ,526 | ,191 | ,476 | ,476 | ,458 |
| | VAR16 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,653 | ,685 | ,204 | ,617 | ,612 | ,497 |
| | VAR17 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,587 | ,198 | ,605 | ,621 | ,571 |
| | VAR18 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,176 | ,613 | ,617 | ,519 |
| | VAR19 | ,218 | ,109 | ,003 | ,014 | ,018 | ,020 | ,026 | ,308 | ,036 | ,002 | ,009 | ,027 | ,020 | ,003 | ,007 | ,005 | ,006 | ,012 | 1,000 | ,281 | ,370 | ,119 |
| | VAR20 | ,001 | ,004 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,713 | ,579 |
| | VAR21 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | 1,000 | ,618 |
| | VAR22 | ,002 | ,030 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,000 | ,066 | ,000 | ,000 | 1,000 |

⁸¹ Upper half of matrix presents correlation coefficients, lower half provides significance values.

Appendix 17.: Questionnaire of deep interview

Name of company: _____

Name of respondent: _____

Questions:

- (1) How would you describe the service in *general* from the customers' point of view?
- (2) How would you describe high level (quality) service in *your service activity* from the customers' point of view?
- (3) How would you describe the *ideal company* in your field of activity?
- (4) Which factors are relevant for customers in rating service quality?
- (5) How do you control, follow up service quality in your company?
- (6) Do you take efforts to improve service quality, if yes, how?
- (7) Are there any barriers of providing high level service?

Appendix 18.: Quality attributes based on deep interviews and academic literature

| Quality attributes by managers | Quality attributes by customers | Main quality-dimensions in academic literature |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>modern, convenient conditions</p> <p>fast, accurate, reliable, competence, courteous, fast problem-solving, friendly employees, professional, keep the promises</p> <p>wide range of goods, easy access, parking, personalized, good backoffice services</p> | <p>Store is nice, use of professional equipments, nice design, convenient conditions in the store, find what looking for, cleanness</p> <p>Reliable, accurate, can answer my questions, I do not have to wait for a long time, solve my problems immediately, I get useful informations, good mood, they do things on time they promised, they offer individual solutions, courtesy, friendliness, fast administration, helpful employees, I feel safe, they changed the chair broken during transportation without any further questions</p> <p>Available, accessible, they offer such extra services, that I do not expected before, the service level is high in each sites, there is a lot of parking place, it can be reach easily by phone, I can choose the article on the internet, wide range of services and goods, easily approachable, they are open on weekends, I can pay by credit cards, flexibility, simple ordering process</p> | <p>Professional judgement, Behavioral aspects, Physical facilities and processes (Haywood-Farmer, 1988)</p> <p>Pivotal attributes, Core attributes, Peripheral attributes (Philip and Hazlett, 1997)</p> <p>Physical aspects, reliability, personal interactions, problem-solving, policy (Dabholkar et al., 1996)</p> <p>Interaction quality, physical environment, result quality–attitude, behavior, expertise, environmental conditions, design, social aspects, waiting time, tangibles, valence (Brady and Cronin, 2001)</p> <p>Behavior, expertise, problem-solving, equipment, environment, waiting time, value(Caro, Roemer, 2006)</p> <p>Core service, human elements, standardization, tangibles, social responsibility (Sureshchandar et al., 2001)</p> <p>Tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communication, vevő megértése understanding/knowing the customer (Parasuraman et al., 1988)</p> |

Appendix 19.: 27 theoretical statements of retail service quality scale

| No. | Statement |
|-----|--------------------------------------------------------------------------------------------|
| 1 | This store has modern-looking equipment and fixtures. |
| 2 | The physical facilities at this store are visually appealing. |
| 3 | The store layout at this store makes it easy for customers to find what they need |
| 4 | This store has clean, attractive, and convenient public areas |
| 5 | The ambient conditions (temperature, scent, noise, ventilation) of the store are pleasant. |
| 6 | This store provides its services at the time it promises to do |
| 7 | This store insists on error-free transactions |
| 8 | This store performs the service right the first time |
| 9 | When this store promises to do something by a certain time, it will do |
| 10 | Employees in this store do not have the knowledge to answer customer's questions |
| 11 | The behavior of employees in this store instill confidence in customers |
| 12 | Employees in this store do not give prompt service to customers |
| 13 | Employees in this store consistently courteous with customers |
| 14 | This store disregards the individual requests of the customer |
| 15 | This store willingly handles returns and exchanges |
| 16 | Employees of this store are able to handle customer complaints directly and immediately |
| 17 | Directly the competent employees of this store handles the problems of customers |
| 18 | When a customer has a problem, this store shows sincere interest in solving it |
| 19 | This store disregards the requests of customers upon forming the range |
| 20 | This store offers wide range and diversity of services. |
| 21 | This store offers high quality merchandise |
| 22 | This store does not provide plenty of convenient parking for customers |
| 23 | This store operating hours not convenient to all their customers |
| 24 | This store does not accept most major credit cards |
| 25 | This store treat stemming from the belief everyone, big or small alike |
| 26 | This store provides service to people belonging all strata of the society |
| 27 | The store promotes ethical conduct in everything it does |

Appendix 20.: Tables of principal component analysis – scale testing

KMO and Bartlett's test

| | | |
|-------------------------------------------------|------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0,851 |
| Approx. Chi-square | | 1671,763 |
| Bartlett's test of Sphericity | Df | 276 |
| | Sig. | 0,000 |

Communalities

| | Initial | Extraction |
|-----|---------|------------|
| Q1 | 1,000 | 0,744 |
| Q2 | 1,000 | 0,817 |
| Q3 | 1,000 | 0,801 |
| Q4 | 1,000 | 0,873 |
| Q5 | 1,000 | 0,838 |
| Q6 | 1,000 | 0,762 |
| Q7 | 1,000 | 0,878 |
| Q8 | 1,000 | 0,781 |
| Q9 | 1,000 | 0,804 |
| Q10 | 1,000 | 0,839 |
| Q11 | 1,000 | 0,837 |
| Q12 | 1,000 | 0,828 |
| Q13 | 1,000 | 0,805 |
| Q14 | 1,000 | 0,819 |
| Q15 | 1,000 | 0,801 |
| Q16 | 1,000 | 0,656 |
| Q17 | 1,000 | 0,914 |
| Q18 | 1,000 | 0,926 |
| Q19 | 1,000 | 0,796 |
| Q20 | 1,000 | 0,721 |
| Q21 | 1,000 | 0,833 |
| Q22 | 1,000 | 0,766 |
| Q23 | 1,000 | 0,865 |
| Q24 | 1,000 | 0,816 |

Note: Principal Component Analysis

Rotated component matrix

| | | Component | | | | | | | |
|-----------------------|-----|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Employees' skills | Q12 | 0,809 | | | | | | | |
| | Q10 | 0,799 | | | | | | | |
| | Q11 | 0,773 | | | | | | | |
| | Q13 | 0,612 | | | | | | | |
| Reliability | Q7 | | 0,816 | | | | | | |
| | Q8 | | 0,739 | | | | | | |
| | Q6 | | 0,720 | | | | | | |
| | Q9 | | 0,694 | | | | | | |
| Problem-solving | Q14 | | | 0,787 | | | | | |
| | Q15 | | | 0,749 | | | | | |
| | Q16 | | | 0,635 | | | | | |
| Physical appearance | Q3 | | | | 0,831 | | | | |
| | Q2 | | | | 0,830 | | | | |
| | Q1 | | | | 0,671 | | | | |
| Service accessibility | Q21 | | | | | 0,880 | | | |
| | Q19 | | | | | 0,860 | | | |
| | Q20 | | | | | 0,794 | | | |
| Social aspects | Q23 | | | | | | 0,858 | | |
| | Q22 | | | | | | 0,766 | | |
| | Q24 | | | | | | 0,595 | | |
| Service product | Q18 | | | | | | | 0,941 | |
| | Q17 | | | | | | | 0,882 | |
| Comfort elements | Q4 | | | | | | | | 0,861 |
| | Q5 | | | | | | | | 0,726 |

Note: Principal Component Analysis, Rotation: Varimax with Kaiser Normalization (7 iteration)

Appendix 21.: Retail service quality questionnaire

Dear Customer!

The questionnaire is to assess our company's service quality by our customers' ratings. For each statement, please show the extent to which you believe our company has the feature described by the statement on the scale ranged from 0 to 10 (where „0” means „strongly disagree”, „10” means „strongly agree”).

Sex of respondent: female: ☐ male: ☐

Age of respondent: Below 20 ys: ☐ 20-30 ys: ☐ 31-40 ys: ☐ 41-50 ys: ☐ 51-60 ys: ☐ Above 61 ys: ☐

| No. | Statement | Strongly disagree | | | | | | | | | | Strongly agree |
|-----|--------------------------------------------------------------------------------------------|-------------------|------|---|------|---|------|---|---|---|---|----------------|
| Q1 | This store has modern-looking equipment and fixtures. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q2 | The physical facilities at this store are visually appealing. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q3 | The store layout at this store makes it easy for customers to find what they need | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q4 | This store has clean, attractive, and convenient public areas | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q5 | The ambient conditions (temperature, scent, noise, ventilation) of the store are pleasant. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q6 | This store provides its services at the time it promises to do | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q7 | This store insists on error-free transactions | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q8 | This store performs the service right the first time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q9 | When this store promises to do something by a certain time, it will do | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q10 | Employees in this store do not have the knowledge to answer customer's questions | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q11 | The behavior of employees in this store instill confidence in customers | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q12 | Employees in this store do not give prompt service to customers | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q13 | Employees in this store consistently courteous with customers | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q14 | This store willingly handles returns and exchanges | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q15 | Employees of this store are able to handle customer complaints directly and immediately | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q16 | When a customer has a problem, this store shows sincere interest in solving it | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q17 | This store offers a wide range and diversity of services. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q18 | This store offers high quality merchandise | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q19 | This store does not provide plenty of convenient parking for customers | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q20 | This store operating hours not convenient to all their customers | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q21 | This store does not accept most major credit cards | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q22 | This store treats stemming from the belief, everyone, big or small, alike | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q23 | This store provides service to people belonging all strata of the society | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Q24 | The store promotes ethical conduct in everything it does | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | | | |
| + | The company's overall service quality is ... | Excellent | Good | | Fair | | Poor | | | | | |

Appendix 22.: Basic statistics of preliminary and cross-validation studies

| Statement | Retailer of mobile phone (n=100) | | Tyre retailer (n=154) | | Retailer of electrical goods (n=185) | |
|------------------------------------------------------------------------------------------------|----------------------------------|-----------|-----------------------|-----------|--------------------------------------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Q1. This store has modern-looking equipment and fixtures. | 7,17 | 1,63 | 8,43 | 1,82 | 7,98 | 1,93 |
| Q2. The physical facilities at this store are visually appealing. | 7,05 | 1,65 | 8,37 | 1,64 | 8,14 | 1,34 |
| Q3. The store layout at this store makes it easy for customers to find what they need | 7,25 | 1,71 | 8,36 | 1,46 | 8,21 | 1,53 |
| Q4. This store has clean, attractive, and convenient public areas | 6,65 | 1,74 | 8,03 | 1,49 | 7,85 | 1,44 |
| Q5. The ambient conditions (temperature, scent, noise, ventilation) of the store are pleasant. | 7,01 | 1,57 | 8,85 | 1,50 | 8,63 | 1,67 |
| Q6. This store provides its services at the time it promises to do | 6,57 | 2,02 | 8,92 | 1,39 | 8,58 | 1,25 |
| Q7. This store insists on error-free transactions | 7,09 | 1,76 | 9,12 | 1,24 | 8,81 | 1,08 |
| Q8. This store performs the service right the first time | 7,07 | 1,79 | 9,16 | 1,35 | 9,01 | 1,31 |
| Q9. When this store promises to do something by a certain time, it will do | 6,75 | 1,86 | 9,06 | 1,35 | 8,74 | 1,10 |
| Q10. Employees in this store do not have the knowledge to answer customer's questions | 6,31 | 1,73 | 8,85 | 1,93 | 8,83 | 1,40 |
| Q11. The behavior of employees in this store instill confidence in customers | 6,71 | 1,82 | 9,07 | 1,48 | 8,52 | 1,23 |
| Q12. Employees in this store do not give prompt service to customers | 6,43 | 1,62 | 8,77 | 2,08 | 8,71 | 1,30 |
| Q13. Employees in this store consistently courteous with customers | 6,94 | 1,85 | 8,98 | 1,70 | 8,60 | 1,36 |
| Q14. This store willingly handles returns and exchanges | 6,40 | 1,96 | 9,15 | 1,25 | 9,03 | 1,17 |
| Q15. Employees of this store are able to handle customer complaints directly and immediately | 6,04 | 1,96 | 8,12 | 1,85 | 8,61 | 0,92 |
| Q16. When a customer has a problem, this store shows sincere interest in solving it | 5,61 | 2,00 | 8,87 | 1,50 | 8,92 | 1,23 |
| Q17. This store offers wide range and diversity of services. | 6,74 | 1,64 | 8,09 | 1,40 | 8,57 | 1,26 |
| Q18. This store offers high quality merchandise | 6,53 | 1,31 | 7,87 | 1,43 | 7,92 | 1,06 |
| Q19. This store does not provide plenty of convenient parking for customers | 8,84 | 1,78 | 8,70 | 1,54 | 8,81 | 1,19 |
| Q20. This store operating hours not convenient to all their customers | 7,95 | 2,23 | 8,36 | 1,78 | 8,67 | 1,32 |
| Q21. This store does not accept most major credit cards | 8,11 | 2,51 | 8,61 | 1,43 | 8,65 | 1,17 |
| Q22. This store treats, stemming from the belief, everyone, big or small alike | 7,13 | 1,89 | 9,19 | 1,30 | 8,92 | 1,27 |
| Q23. This store provides service to people belonging all strata of the society | 6,74 | 1,75 | 8,54 | 1,93 | 8,76 | 1,27 |
| Q24. The store promotes ethical conduct in everything it does | 6,91 | 1,61 | 8,39 | 1,75 | 8,72 | 1,12 |

Appendix 23.: Correlation matrix of subdimensions

Correlation matrix (retailer of mobile phones)

| | | Physical appearance | Comfort elements | Reliability | Employees skills | Problem-solving | Service product | Service accessibility | Social aspects |
|-------------|-----------------------|---------------------|------------------|-------------|------------------|-----------------|-----------------|-----------------------|----------------|
| Correlation | Physical appearance | 1,000 | 0,630 | 0,438 | 0,456 | 0,338 | 0,193 | 0,238 | 0,451 |
| | Comfort elements | 0,630 | 1,000 | 0,304 | 0,420 | 0,378 | 0,266 | 0,132 | 0,440 |
| | Reliability | 0,438 | 0,304 | 1,000 | 0,605 | 0,650 | 0,323 | 0,249 | 0,491 |
| | Employees skills | 0,456 | 0,420 | 0,605 | 1,000 | 0,691 | 0,368 | 0,193 | 0,622 |
| | Problem-solving | 0,338 | 0,378 | 0,650 | 0,691 | 1,000 | 0,278 | 0,080 | 0,544 |
| | Service product | 0,193 | 0,266 | 0,323 | 0,368 | 0,278 | 1,000 | 0,221 | 0,376 |
| | Service accessibility | 0,238 | 0,132 | 0,249 | 0,193 | 0,080 | 0,221 | 1,000 | 0,166 |
| | Social aspects | 0,451 | 0,440 | 0,491 | 0,622 | 0,544 | 0,376 | 0,166 | 1,000 |

Correlation matrix (tyre retailer/retailer of electrical goods)

| | | Physical appearance | Comfort elements | Reliability | Employees skills | Problem-solving | Service product | Service accessibility | Social aspects |
|-------------|-----------------------|---------------------|------------------|-------------|------------------|-----------------|-----------------|-----------------------|----------------|
| Correlation | Physical appearance | 1,000 | 0,572 | 0,411 | 0,356 | 0,425 | 0,283 | 0,386 | 0,367 |
| | Comfort elements | 0,712 | 1,000 | 0,198 | 0,242 | 0,315 | 0,373 | 0,266 | 0,278 |
| | Reliability | 0,425 | 0,327 | 1,000 | 0,486 | 0,543 | 0,267 | 0,311 | 0,301 |
| | Employees skills | 0,571 | 0,565 | 0,378 | 1,000 | 0,439 | 0,390 | 0,367 | 0,334 |
| | Problem-solving | 0,492 | 0,528 | 0,292 | 0,723 | 1,000 | 0,373 | 0,401 | 0,408 |
| | Service product | 0,421 | 0,459 | 0,160 | 0,513 | 0,552 | 1,000 | 0,349 | 0,349 |
| | Service accessibility | 0,397 | 0,328 | 0,419 | 0,418 | 0,265 | 0,242 | 1,000 | 0,368 |
| | Social aspects | 0,657 | 0,655 | 0,408 | 0,629 | 0,672 | 0,495 | 0,366 | 1,000 |

Note: Below the diagonal correlation coefficients of tyre retailer, above the diagonal correlation coefficients of retailer of electrical goods are shown.

Appendix 24.: Correlation matrices of primary dimensions

Correlation matrix (retailer of mobile phone)⁸²

| | FIZASP | MEGBIZ | SZEMKAPC | UZLPOL |
|-----------------|---------------|---------------|-----------------|---------------|
| FIZASP | 1,000 | 0,406 | 0,477 | 0,460 |
| MEGBIZ | 0,406 | 1,000 | 0,684 | 0,498 |
| SZEMKAPC | 0,477 | 0,684 | 1,000 | 0,512 |
| UZLPOL | 0,460 | 0,498 | 0,512 | 1,000 |

Correlation Matrix (tyre retailer)

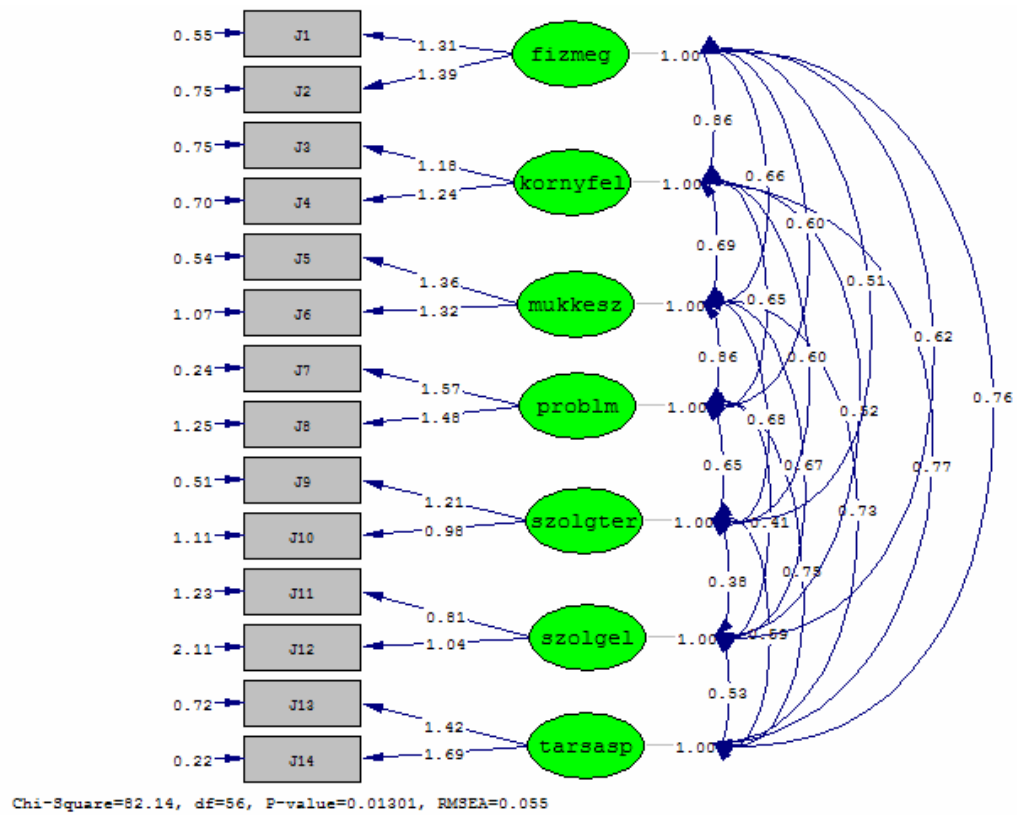
| | FIZASP | MEGBIZH | SZEMKAPC | UZLPOL |
|-----------------|---------------|----------------|-----------------|---------------|
| FIZASP | 1,000 | 0,408 | 0,625 | 0,705 |
| MEGBIZH | 0,408 | 1,000 | 0,359 | 0,439 |
| SZEMKAPC | 0,625 | 0,359 | 1,000 | 0,729 |
| UZLPOL | 0,705 | 0,439 | 0,729 | 1,000 |

Correlation Matrix (retailer of electronical goods)

| | FIZASP | MEGBIZH | SZEMKAPC | UZLPOL |
|-----------------|---------------|----------------|-----------------|---------------|
| FIZASP | 1,000 | 0,342 | 0,436 | 0,486 |
| MEGBIZH | 0,342 | 1,000 | 0,600 | 0,388 |
| SZEMKAPC | 0,436 | 0,600 | 1,000 | 0,586 |
| UZLPOL | 0,486 | 0,388 | 0,586 | 1,000 |

⁸² FIZASP = Physical aspects; MEGBIZH = Reliability; SZEMKAPC = personal interactions; UZLPOL = Business policy

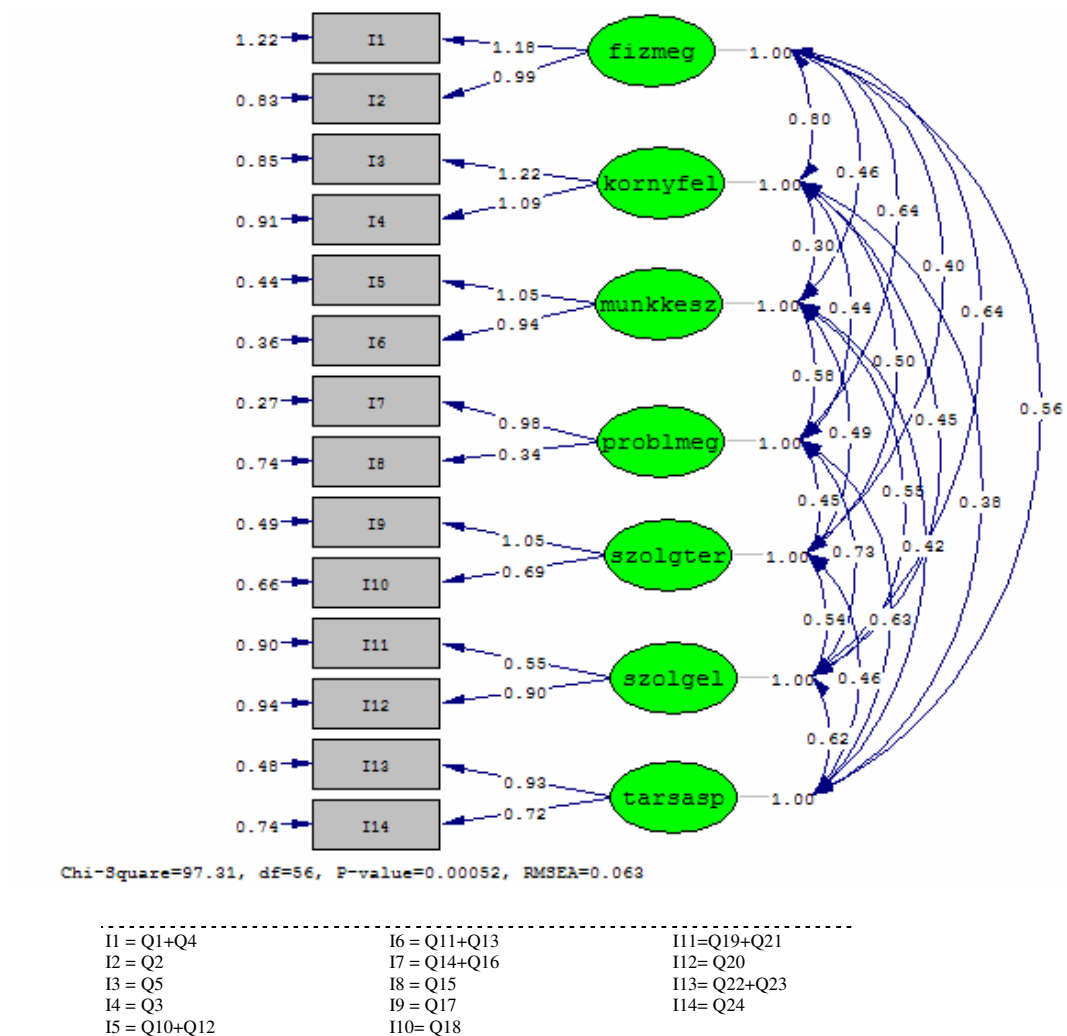
Appendix 25.: First order SEM of subdimensions (applying partial disaggregation) – sample of tyre retailer⁸³



| | | |
|--------------|--------------|--------------|
| J1 = Q1+Q4 | J6 = Q11+Q13 | J11=Q19+Q21 |
| J2 = Q2 | J7 = Q14+Q16 | J12= Q20 |
| J3 = Q5 | J8 = Q15 | J13= Q22+Q23 |
| J4 = Q3 | J9 = Q17 | J14= Q24 |
| J5 = Q10+Q12 | J10= Q18 | |

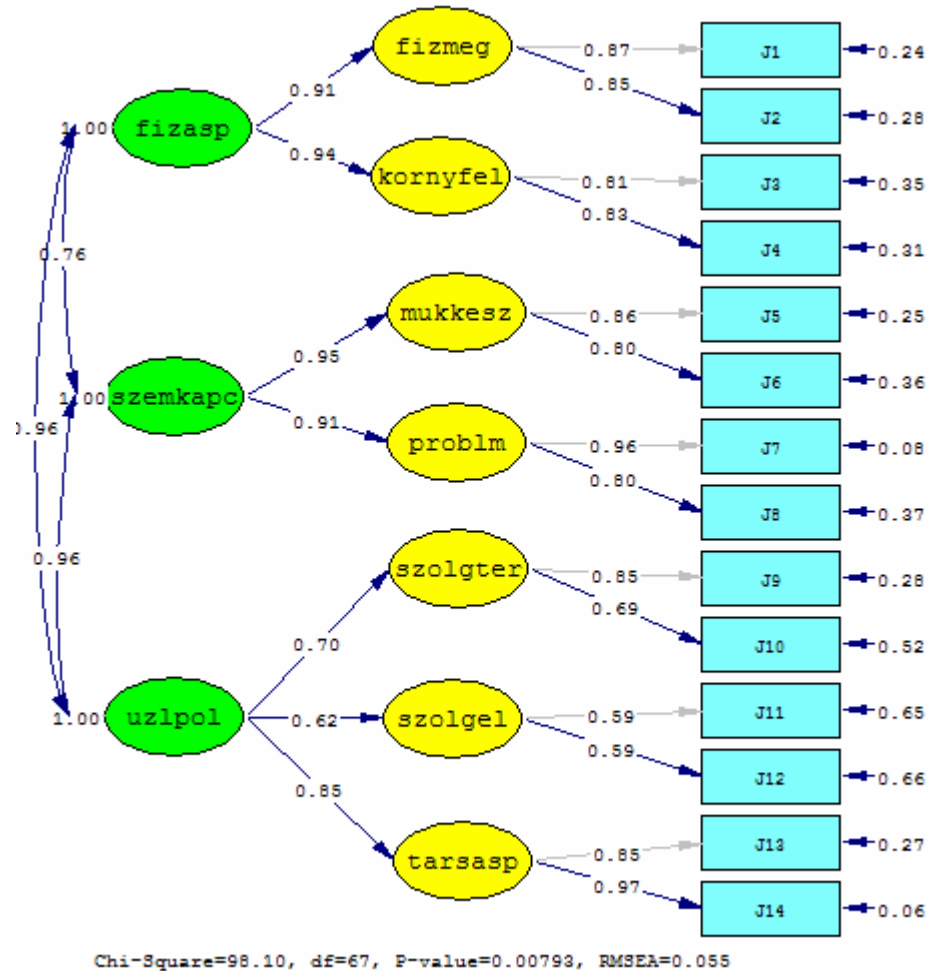
⁸³ Estimated parameters; fizmeg = physical appearance; kornyfel = comfort elements; munkesz = employees' skills; problm = problem-solving; szolgter = service product; szolgel = service accessibility; tarsasp = social aspects

Appendix 26.: First order SEM of subdimensions (applying partial disaggragation) – sample of retailer of electronical goods⁸⁴



⁸⁴ Estimated parameters; fizmeg = physical appearance; kornyfel = comfort elements; munkkesz = employees' skills; problm = problem-solving; szolgter = service product; szolgel = service accessibility; tarsasp = social aspects

Appendix 27.: Second order SEM (applying partial disaggregation) – sample of tyre retailer⁸⁵



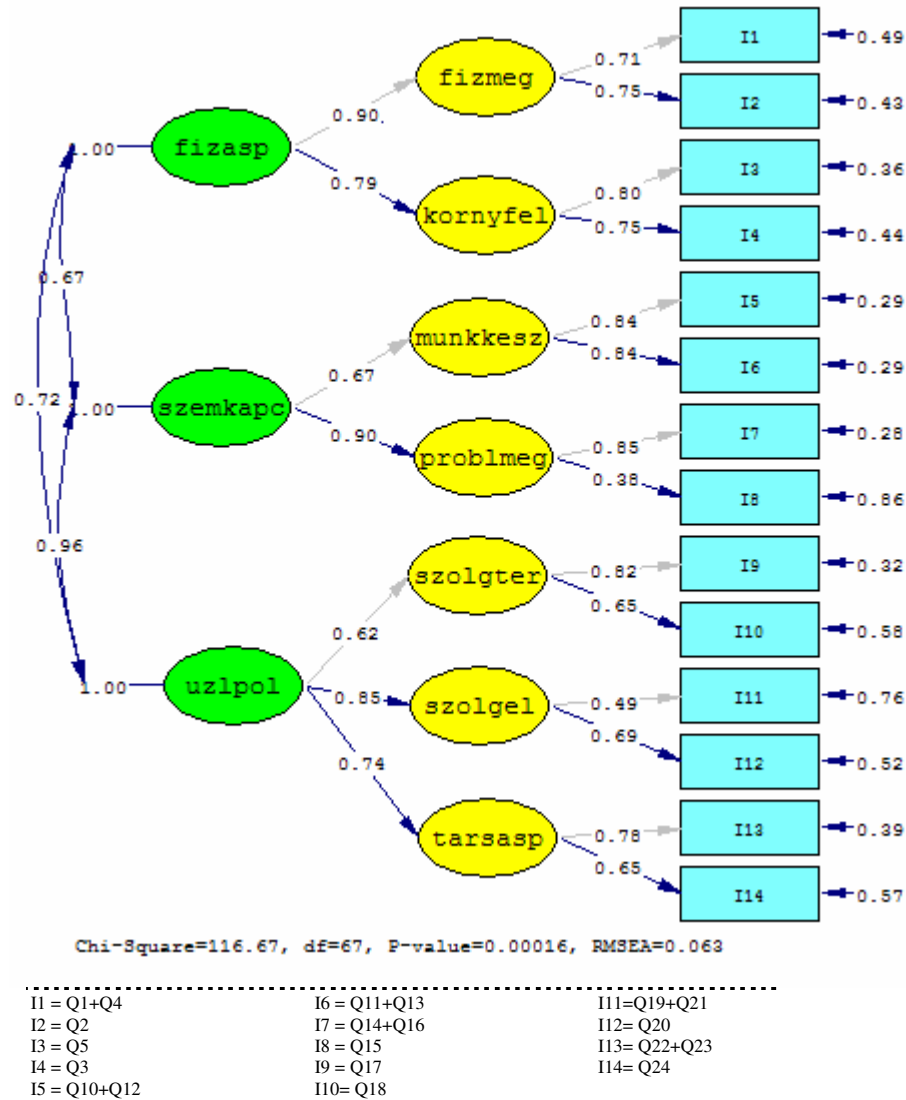
J1 = Q1+Q4
J2 = Q2
J3 = Q5
J4 = Q3
J5 = Q10+Q12

J6 = Q11+Q13
J7 = Q14+Q16
J8 = Q15
J9 = Q17
J10 = Q18

J11 = Q19+Q21
J12 = Q20
J13 = Q22+Q23
J14 = Q24

⁸⁵ Standardized parameters; fizasp = physical aspects; szemkapc = personal interaction; uzlpol = business policy; fizmeg = physical appearance; kornyfel = comfort elements; mukkesz = employees' skills; problm = problem-solving; szolgter = service product; szolgel = service accessibility; tarsasp = social aspects

**Appendix 28.: Second order SEM (applying partial disaggregation)
– sample of retailer of electronical goods⁸⁶**



⁸⁶ Standardized parameters; fizasp = physical aspects; szemkapc = perosnal interaction; uzlpol = business policy; fizmeg = physical appearance; kornyfel = comfort elements; munkkesz = employees' skills; problm = problem-solving; szolgter = service product; szolgel = service accessibility; tarsasp = social aspects